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SUPPLEMENT TO

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January, 1891.

KOCH'S TREATMENT OF TUBERCULOSIS.

(*Special Cable Dispatch from Berlin.*)

It will be remembered that Prof. Robert Koch made a preliminary announcement at the Berlin Congress concerning certain experiments he had undertaken which promised to provide a specific against tuberculosis; and that since then, not only the medical profession, but the civilized world has been in a state of anxious attention. On November 14, 1890, Professor Koch considered himself warranted in making an announcement in the *Deutsche medicinische Wochenschrift* which has made Berlin the Mecca for cases of phthisis as well as for physicians of both continents. The *Therapeutische Monatshefte* publishes a supplement containing reports by Doctors Feilchenfeld, von Bergmann, and Fräntzel, which bring our information down to November 17th. Gerhardt gave a lecture on November 18th, of which the *British Medical Journal* contains a brief notice. The special correspondent of The American Journal of the Medical Sciences cables from Berlin, under date of December 8th:

"So far as we can learn, the material which is used by injection for the cure of tuberculous disease is itself a product of the action of the tubercle bacillus upon a culture-medium, the composition of which has not yet been made known, under conditions which are also still unrevealed. It probably contains, in addition to the *toxine* or *toxines* to which its activity is due, a minute quantity of cyanide of gold, as a protective against possible contamination with the bacilli themselves. 'Koch's lymph,' as it is called, is prepared for use in the following manner: One gramme of the lymph, with nine grammes of a two-per-cent. carbolic acid solution, constitutes the first (ten per cent.) dilution, from which a second (one per cent.) dilution is made in a similar manner—nine grammes of carbolized solution being added to one gramme of the diluted lymph; and from this again a third (one-tenth per cent.) dilution is made—one gramme of twice-diluted lymph to nine grammes of carbolized solution. This third dilution then contains one part of the lymph in one thousand parts of the preparation, so that a dose of one gramme of fluid contains one milligramme of the lymph. As a rule, the patient is subjected first to this dose. Should no effect be produced by repeated doses, the amount is increased to a dose not exceeding six centigrammes. Koch always makes use of a freshly-prepared solution.

"Introduced into the stomach the remedy has no effect; it is, therefore, injected subcutaneously by means of the small syringe suggested by Koch for bacteriological work; the site of injection is the skin of the back between the shoulder-blades and the lumbar region, or, more recently, in the gluteal region. From three to eight hours after the injection. the effects begin to be manifested. They vary greatly in different subjects, and are said not to occur at all unless tuberculosis is present. The presence or absence of 'reaction' then is assumed to be a diagnostic sign, and this test was made use of by Gerhardt and von Bergmann to discriminate between cancer and tuberculosis of the larynx; and more recently between tuberculosis and syphilis of the palate. Upon the same principle, a patient who no longer manifests reaction after receiving the maximum dose of the remedy is assumed to be cured, though, for the present, Dr. Koch and his assistants very wisely speak of provisional cure only, as sufficient time has not yet elapsed to test its permanency.

"Among the provisional cures are cases of lupus, of tuberculosis of the larynx, of incipient phthisis, and of white swelling in children. Children stand the treatment well if care be taken not to begin with too large a dose.

"Reaction is manifested both by local and constitutional symptoms: the latter comprise pain in the limbs, fever, sometimes chill, nausea and vomiting, in phthisical cases cough and dyspnœa, and in a few cases sensorial disturbances such as somnolence and delirium. The fever may rise as high as 40° or 41° C., in which event great cardiac depression and even collapse are likely to occur. Sometimes the temperature suddenly falls to 36° or even 35.5° C. During the next day, however, there is a slight elevation of temperature to 37.8° or 39° C., called by Koch the 'secondary reaction.' The temperature again sinks below normal when the second stronger injection is given, which is followed by high fever as before.

"The local manifestations consist in swelling and discoloration of the affected tissues, which finally necrose, and are either spontaneously expelled, or must be removed by surgical means.

"In cases of lupus, the local reactions, which are easily observed, have been very striking. The affected tissues become very red and swollen, surrounded by a raised border sharply defined, usually dark red in color, in some cases whitish, and varying from the breadth of a few millimetres to that of a finger.

"After the subsidence of the fever, the swelling of the lupus-tissue gradually decreases and disappears. The lupus-spots are covered by a soft deposit which desiccates into a crust; the crusts falling off, clean, red cicatrices are left. Of one case Feilchenfeld says that the pathological tissue seemed to have been removed as with a punch.

"If local reaction is observed in sites previously thought to be healthy, it is held to indicate the presence of unsuspected tuberculous disease. In many cases of lupus this has been a marked feature of the progress of the case toward recovery.

"As already stated, the symptoms of the reaction vary greatly in different individuals and in different forms of tuberculous disease.

"A slight punctiform rash sometimes appears over the whole of the body. In some cases a slight amount of albuminuria has been noted.

"The physiological disturbance from a given dose is greatest in acute cases. As recovery progresses, the dose necessary to produce reaction must be progressively increased, until finally, when the largest dose—six centigrammes—fails to produce reaction, cure is assumed to be complete. Cases of surgical tuberculosis begin to react only under a dose of five milligrammes or more. Until now the injections have been administered on alternate days, so that the effects might be better studied; but Koch maintains that the more rapid and intense the treatment, the more rapid and safe must be the cure, and the intervals between the injections will probably be diminished.

"The injections must be supplemented by the best possible hygiene and measures calculated to promote nutrition generally. Especially is this necessary in cases of suppurative joint-disease. In these cases, too, the 'cure' progresses slowly, and surgical interference is requisite to complete it.

"The action of the lymph seems to be the destruction of tuberculous tissue, and the constitutional disturbances seem to be correlated with this process. The more extensive the lesions the more pronounced are the disturbances; and hence the smaller the initial dose which will excite reaction, but the greater number of repetitions ot the injections, and the larger the final dose required, before the reaction ceases to be manifested. Extreme caution is evidently necessary to avoid dangerous constitutional reaction in cases of widely-disseminated tuberculosis; and where the locations of the lesions are such that the local reaction might jeopardize life, the treatment is contra-indicated. Thus, at least three conditions may be enumerated in which recourse to the method must be pronounced unjustifiable:

"1st. Advanced pulmonary tuberculosis.

"2d. Severe laryngeal tuberculosis.

"3d. Tuberculosis of the brain or meninges.

"But even in apparently mild cases there may lurk unsuspected dangers. A man who had for a short time exhibited symptoms ot pulmonary tuberculosis, received in three days two injections, the first of two milligrammes, and the second of three milligrammes, ot the lymph. Reaction was excessive, and five days later he died.

"Slight cavities were found at one apex, both lungs were hepatized and were infiltrated throughout with miliary tubercles. It is conjectured that the hepatization was the effect of the local reactions at the numerous foci offered by the disseminated miliary tubercles: this theory assumes the previous existence of these latter, but who shall say that they were not produced by the injections? The time is not too short to have permitted this. At all events, death seems to have been directly due to the treatment.

"In a private conversation held with Koch to-day, he said that though the Government now reserves the right of preparing the lymph, in a short while all applicants would be supplied. It is my impression that Koch desires the method to be firmly established before any doubts could be cast upon it by impure or otherwise imperfect lymph, which source of danger is now eliminated by the stand taken by the German Government. At present it is impossible to procure the article and more than five thousand applications have already been filed for it. Hundreds of doctors from the world over are returning home satisfied with the results demonstrated, but with only the hope of receiving the lymph at some future time."

THE

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JANUARY, 1891.

CARDIAC COMPLICATIONS IN GONORRHŒAL RHEUMATISM.[1]

By Richard Lea MacDonnell, B.A., M.D.,
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Inasmuch as many are in doubt as to whether gonorrhœal rheumatism ever affects the heart, I propose to review briefly the literature of the subject, to give the results of a critical examination of the histories of twenty-seven cases of gonorrhœal rheumatism, and to relate somewhat in detail the history of a remarkable case in which I believe the urethral affection was closely connected with the morbid processes which subsequently attacked the pericardium, the endocardium, and the pleura.

I shall not deal with the question as to whether gonorrhœal rheumatism exists, whether the affection we know by that name is a real rheumatism, or whether, if it be a rheumatism, it is caused by a gonorrhœa. I shall merely state that there is a form of joint affection associated with a discharge from the urethra, and that this joint affection differs from ordinary acute or subacute rheumatism in certain characteristics, one of which is said to be that it is never associated with affections of the heart.

In English and American treatises little mention is made of the possibility of the connection. Howard, in his article on "Gonorrhœal Rheumatism" in Pepper's *System of Medicine*, speaks of the connection as being a point on which there is much difference of opinion. He admits that cases have been reported which appear to have been authentic cases of gonorrhœal endocarditis, but remarks that it would be impossible at times to distinguish a polyarticular acute gonorrhœal rheumatism from ordinary acute articular rheumatism, and he mentions the possibility of the heart symptoms being due to pyæmia.

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[1] A paper read at the annual meeting of the Canadian Medical Association at Toronto, Sept. 1890.

Cases have been from time to time recorded in the journals. The connection is alluded to by Davies Colley, who in an essay on "Gonorrhœal Rheumatism" in *Guy's Hospital Reports*, spoke of one form of the disease which he called the inflammatory form, and which is specially liable to attack fibrous structures not connected with joints, *e. g.*, plantar fascia, the sclerotic coat of the eyeball, the iris, the pericardium, and the endocardium, the attack on these last two being usually associated with gonorrhœal arthritis.

In an article on the same subject in the same publication Dr. Pye Smith analyzed the histories of twenty nine cases of gonorrhœal rheumatism and found that in one of them a basic systolic murmur was reported, which he passed over as being most probably of functional origin.

In 1884 a case was reported by Railton of a man, aged twenty-one, who after having suffered for six weeks from a gonorrhœal discharge, was attacked with sore throat, fever (102°), headache. Four days afterward there was pain in the right wrist and sour-smelling perspiration, but no cardiac implication. Two days after this there were evidences of endocarditis. He recovered after some weeks' illness, and the murmurs were said to have disappeared.

The subject is dealt with more fully by French writers. Marty, in 1876, published an article in the *Archives Générales de Médecine*, in which the literature of the subject up to date was reviewed and the histories of nine cases were given as well as one which he observed himself. One of these cases is of particular interest, as it resembles my case in the comparative insignificance of the joint affection. It is that reported by Lacassagne. The patient was a young man who entered hospital with diarrhœa as well as a gonorrhœa. Two days after admission there was sudden pain in the chest, physical signs of endocarditis, and elevation of temperature. No joint pain was observed.

Marty's own case presented the following history:

D., aged twenty-two. No rheumatic or cardiac antecedents. When five years old he was subject to palpitations, but for several years past he has been in the habit of lifting heavy weights without any trouble. In the fifth week of his gonorrhœa he had repeated rigors and intense headache, and a few days afterward it was noticed that there was a systolic murmur at the base of the heart. This was followed by a rise of temperature, presternal pain and vomiting followed by palpitation. The patient eventually recovered, though the murmur remained.

Marty's general conclusions are as follows:

Gonorrhœa may be complicated with inflammation of all the serous membranes, and may act in a direct way on each of them. Rheumatism is by no means a necessary middle term between the specific lesion and the lesion of the serous membrane, although the cases of coexistence of the two complications are most frequent. The cardiac complications are rare. Of the several orifices the aortic one is most commonly attacked. Endocarditis appears to have occurred as frequently as pericarditis, if not more so.

In 1884 a case was recorded by MM. Derignac and Moussons in the *Gazette Médicale de Paris:*

> A man, aged twenty-five, in the fourth week of his gonorrhœa was seized with pain in his left shoulder which soon shifted to his right shoulder and there remained. No other joint was affected. There was no previous history of joint affections, or family history of rheumatism. He had never had scarlet or typhoid fever, and he presented no signs of syphilis, alcoholism, or chorea. Two weeks later there was a sudden rise of temperature (102.6° F), with cardiac distress. Well-marked systolic murmur. The symptoms subsided but the bruit remained, and there was subsequent atrophy of the deltoid and brachial muscles.

In Germany the subject has attracted more attention than elsewhere, several important monographs having been published during the last twenty years by Nolen, Pfuhl, Loeb, Guntz, and others. The first of these has collected fifteen cases of so-called heart complications. I have not been able to see this monograph, but I infer from the criticism of Loeb that the writer includes cases in which no further evidences of cardiac disease existed than reduplication of the first sound. Such cases cannot be included under the category of organic lesions, and the number of his cases must therefore suffer reduction.

Quite recently the subject has been dealt with somewhat exhaustively by Gluzinski, an abstract of whose paper is given in the Vienna correspondence of the *British Medical Journal* for the early part of 1889. It is stated that Brande, in 1854, published two cases of endocarditis and pericarditis, respectively, in connection with gonorrhœal rheumatism, and that Sigmund, in 1858, published two cases. Gluzinski himself collected thirty-one cases, and derived from them the following conclusions: 1. Pericarditis as well as endocarditis might supervene in the course of gonorrhœa. 2. These may develop after gonorrhœal rheumatism, but also without the presence of such an affection. 3. The complaint sometimes assumes the character of a severe infectious disease, as in endocarditis ulcerosa, and runs an acute course, and sometimes gives rise to failure of the heart. Gluzinski believes that the endocarditis is the result of the action of microörganisms on the valves, and he quotes a case published by Weichselbaum where gonorrhœa was complicated with endocarditis and cardiac failure, and the streptococcus pyogenes was found in the vegetations of the valves.

In eight of Gluzinski's cases the symptoms were mild. The patients complained of "stitch" in the left chest and palpitations. There was accelerated and increased action of the heart, and frequently also a slight pericardial râle. In the majority rheumatism was either quite missed or it came on after the cardiac affection had set in. In all the patients there was gonorrhœa of long standing.

This is, therefore, a summary of the literature of the subject. I pass on to what is more interesting—namely, clinical experience.

The medical case-books of the Montreal General Hospital for the last eight years contain the histories of twenty-seven cases—twenty-six males and one female—which have been diagnosed as gonorrhœal rheumatism. Possibly some more cases of the kind may lie concealed among the numerous histories of so-called subacute rheumatism. Of these twenty-seven cases, physical signs of cardiac disease were present in six cases, but of this number two cases can be excluded on the ground that there was a history of acute rheumatism previously to the first attack of gonorrhœa. A history of scarlet fever in childhood, for a like reason, excludes a third case, leaving three cases in which it is probable that the heart affection depended upon a gonorrhœa.

CASE I. *History of acute rheumatism in childhood, very probably with cardiac complications. In adult life a rheumatism, probably gonorrhœal. Systolic murmur present.*—F. J., æt. twenty-five, laborer, admitted into the Montreal General Hospital June 3, 1888, under Dr. Wilkins, complaining of pain in both knees and in the left ankle. He has had attacks similar to the present one, the first when he was twelve years old, the second when he was nineteen. After the first of these attacks he began to suffer from palpitation and faintness on exertion. When twenty-three contracted a gonorrhœa for the first time, and six months ago contracted another. On admission the joints involved were painful, but not swollen or red. A urethral discharge is present. There is a soft, blowing systolic murmur, loudest at apex and transmitted as far as the axilla.

CASE II. *History of acute rheumatism in childhood. Gonorrhœa at the age of eighteen, followed by arthritic pains. Evidences of disease of the mitral valve.*—J. H., æt. nineteen, admitted May 24, 1885, under Dr. Wilkins. Pain and swelling of both knees. Thirteen years ago had acute rheumatism. Contracted gonorrhœa one year ago, and the discharge has been present ever since. Never suffered from dyspnœa. The present illness began six weeks ago, with pain in the right hip, then in the right knee and in soles of the feet. No history of exposure to cold. Pulse irregular and intermittent. No perspiration. Urethral discharge. The cardiac action is diffused. Apex displaced a little downward and outward, and cardiac dulness slightly increased. Loud, harsh presystolic murmur; a systolic murmur also. After a few days in hospital the pains subsided and the patient was discharged.

In these two cases I regard the occurrence of gonorrhœal rheumatism as accidental, and in no way connected with the valvular disease. It may be fairly assumed that in these patients the injury to the valve occurred in childhood. It is curious to note, however, that in both cases the rheumatism took the form most commonly found in connection with gonorrhœa, and not that of acute rheumatism. The fever was slight, and there was no sweating. The joint affection was not general, and in one of the cases it was limited to one knee and one ankle; in the other to one hip, one knee, and the plantar fascia, and in neither case did any metastasis occur.

Case III. *Acute articular pains supposed to be of gonorrhœal origin. Evidences of cardiac enlargement and endocarditis. History of scarlet fever in childhood.*—S. R., æt. twenty-six, a glassblower, was admitted to the General Hospital, April 23, 1890, under the care of Dr. Ross, complaining of pain in the left ankle and knee. He had had scarlet fever and measles in childhood, but he had never had rheumatism.[1] About a month or six weeks before admission he contracted a gonorrhœa; the discharge was copious, but had nearly ceased when the joint pains began. A week before admission he had been drinking and had been much exposed to the weather. The joints attacked were the knees, ankles, and elbows. The joint affection was not severe and subsided in four days.

State of the heart: The impulse is seen and felt one inch below, and half an inch outside the nipple. Dulness begins at the third rib above, and extends transversely from the border of the sternum to one inch outside the nipple. A faint systolic blowing sound can be heard at the apex, and one inch externally.

The patient left the hospital in one month, the joint affection having entirely subsided. There was evidently nothing like suppuration in the joint.

Case IV. *Two distinct attacks of gonorrhœa. Each followed by arthritis; the first by conjunctivitis and swollen testicle. No history whatever of rheumatism or of scarlet fever. Systolic murmur at the apex of heart.*—J. McN., æt. twenty-four, admitted September 4, 1889, under Dr. Wilkins. Dull pain in left hip and ankle. Purulent urethral discharge. No history of rheumatism. Good health until two years ago, when he had an attack of gonorrhœa which was followed very soon by pains in the left ankle. He was laid up for four months, and was thought to have recovered completely. He was well until three months ago, when he had a new attack of gonorrhœa, followed as before by joint pains. The left ankle began gradually to be painful one week after the discharge appeared. At about the same time the right eye became painful and light became intolerable. He was treated for gonorrhœal ophthalmia in the out-patient department of the hospital. In five weeks the eye was well but the discharge was unchecked, and he suffered from obscure joint pains until a fortnight before admission, when the left hip became very painful. At the outset of the gonorrhœa the testicle had been swollen. There was no fever. Severe pain in left hip. Thick urethral discharge.

Heart: No increased area of dulness. A soft blowing systolic murmur was heard at the apex but was not transmitted in any direction. The patient left the hospital fairly well in about a fortnight.

There can be, in this case, no doubt of the gonorrhœal origin of the two articular attacks. There was no fever, no sweating. The attack was gradual, and there was never any severe pain. In his first attack but one joint was involved, and with it the conjunctiva, a most significant coincidence, In the second attack one hip and one ankle alone were attacked. There was no metastasis. The strongest evidence lies in the fact of the attack having followed twice in the course of a recent gonorrhœa.

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[1] No mention is made of his having suffered from cardiac symptoms previously to his admission to hospital.

The heart affection here was evidently a slow endocarditis possibly dating from the first attack, arising as it does in ordinary rheumatism without giving rise to symptoms, and so escaping attention.

CASE V. *Gonorrhœal discharge of three weeks' standing. Acute arthritis in left elbow ending in suppuration and subsequent anchylosis. Endocarditis possibly recent. No history of rheumatism.*—J. S., æt. twenty-one, admitted Sept. 30, 1887, under Dr. Ross. Exposure to cold three days previously followed by chills, slight sore throat, and transient pain in the right thumb. On the following day pain and swelling of left elbow-joint. Has never had rheumatism in any form. A gonorrhœal discharge present for the last three weeks. Has had no headache or sweating. On admission the fauces and uvula were found to be somewhat red, but there was no tonsillitis. Pulse 100; temp. 100.4°. Physical signs of lungs negative.

The apex-beat of the heart is in its usual position and the extent of cardiac dulness is not increased. A rough blowing systolic murmur is heard over the mitral area, most distinctly just over the apex. It is transmitted to the anterior axillary border, and can be heard at the back between the midline and the dorsal border of the scapula. A softer systolic murmur, blowing in character. is heard in the second intercostal space close to the left border of the sternum.

On the fourth day of the illness there were some fugitive pains in the left wrist. Temperature fell to normal. During the next fortnight the left elbow-joint became distended with fluid, which, on aspiration, proved to be pus. The case was transferred to the surgeons. The patient recovered with a stiff joint. During his stay in hospital the heart-murmur diminished in intensity but never disappeared.

There is nothing in this history to warrant the assumption that ordinary acute rheumatism was the cause of the heart affection. There is no history of a previous attack. Exposure to cold is well recognized as the exciting cause of gonorrhœal, as well as of ordinary acute rheumatism. A one-joint affection ending in suppuration can hardly be acute rheumatism. It must be either gonorrhœal rheumatism or a pyæmia, and it is highly probable that the distinction between these two morbid states is merely one of degree. Cases of gonorrhœal rheumatism ending in pyarthrosis are very rare but they have been described. Fifty years ago Vidal (de Cassis) mentioned this termination in his famous treatise on the venereal diseases and gave the particulars of a case ending like this in suppuration and anchylosis.

CASE VI. *Gonorrhœa; rigors; slight joint pains; sudden and urgent dyspnœa; pericarditis; endocarditis; pleuritis; recovery with persistent mitral murmur.*—D. B., æt. twenty-two, a merchant's clerk, of fair complexion, short stature, and very muscular build, had alway been in good health until May 8, 1890, when after a long, cold, wet drive he became thoroughly chilled, and when he alighted from the vehicle he noticed that his knees had become stiff and painful. He took some hot brandy and water and was obliged to go to bed immediately, feeling very ill and uncomfortable. He slept badly, owing to his chilly sensations as well as to the pains he felt in the knees. These pains were not very severe and were not relieved by resting—in fact, he found some relief in moving them about. On the following morning, though he felt tired and uncomfortable, he went to his office, but in the middle of the day he began to experience a sense of oppression in the chest and was obliged to rest that afternoon, though he did not take to bed. The next day was Saturday. He returned to the office in the morning, did all that was required of him, went home to dinner, and in the afternoon took part in.the inspection of the volunteer corps to which he belonged. He felt a little stiff in the knees at starting but at that time felt no shortness of breath or cardiac pain. There was a great deal of marching about and as the afternoon wore on he felt very stiff in the knees and began then, for the first time, to feel pain in the wrist and the ankles. The next day being Sunday he rested in bed all day suffering merely from slight pains and stiffness in his knees, the pain having entirely left the wrists and ankles. On the following (the fifth) day on attempting to dress he found himself very short of breath, and during the day this distress increased rapidly. He found sitting more comfortable than lying and soon he could only breathe comfortably when standing. He now sought advice, and Dr. Herbert Reddy, who was summoned, found him in a state of urgent dyspnœa and breathing forty to the minute. The pupils were widely dilated, and he wore an expression of deep distress and anxiety. The pulse was rapid, but the temperature was not very high. There were no physical signs, and the joint symptoms had at that time completely disappeared. The general appearance was that of a patient in the early stage of a severe pneumonia.

On the afternoon of the following (sixth) day, when I saw him in consultation at Dr. Reddy's request, the patient was in less distress than on the previous day. There was still orthopnœa. Respirations were 36 and the temperature 99°. The resemblance to the appearance of a patient in the early stages of pneumonia was very remarkable, but there were no physical signs in the lungs. Over the base of the heart a double friction-murmur was distinctly audible, extending over an area of about an inch and a half in diameter, with its centre at the middle of the junction of the third costal cartilage with the sternum.

The heart's action was excited but regular, and there was no increase in the area of superficial cardiac dulness.

With such symptoms and physical signs a diagnosis of acute pericarditis was made, and it was not until this stage of the examination was arrived at and a cause for the pericarditis was sought, that he told us about the joint pains, and that he was suffering from a gonorrhœal discharge of some five weeks' standing.

On the following day (seventh) the friction-murmur could not be detected. From the eighth to the tenth day of the illness, when he was under Dr. Reddy's care, the dyspnœa gradually subsided, and the friction-murmur was not again detected.

On May 18th (eleventh day) he was admitted to the Montreal

General Hospital, when the following condition was noted: Patient somewhat pale; pupils dilated; no manifest dyspnœa while at rest; respirations 20; no swellings of the joints; dorsal decubitus. The anxious expression observed at my first examination is no longer present. There is no constant cardiac pain or palpitations. The patient complains of pain merely when he takes a very long breath. The apex-beat of the heart is in its normal position. The heart's action is slow and deliberate. The area of superficial cardiac dulness is not increased, and there is no diminution of the intensity of the cardiac sounds. A systolic murmur is faintly audible at the apex, but it is not heard around the chest. At times when the patient is lying upon his back this murmur is not audible, but it becomes so when he sits up and leans forward. At the base of the heart both the cardiac sounds are quite clear; the pulse beats at 66, regular and compressible.

A urethral discharge has been present for the last six weeks. It had nearly ceased at the time he went out driving, but after the chilling it returned, owing, he thought, to the large quantity of hot brandy and water which was given to him at the time. This is his second attack of gonorrhœa, the first occurred some months previously, and was accompanied by a swollen testicle, but no joint pain. The urine is of normal quantity and specific gravity, and contains no albumin. Temperature 99°.

There is no evidence of any previous illness showing a tendency to rheumatic affections, no scarlet fever, no tonsillitis, no chorea.

Family history: With the aid of the patient's brother, who is a medical man, I was able to look into the family history thoroughly. On the father's side there is no trace of any rheumatic or gouty tendency whatever. On the mother's side, of five uncles and aunts of the patient, one aunt is the subject of heart disease, and the two sons of another aunt have had, the one a chronic affection of the heart and the other recurrent attacks of acute rheumatism.

June 2 (25th day). He has now been a fortnight in hospital, and up to to-day has been doing well. The temperature has been normal or nearly normal; the pulse quiet. There has been very little dyspnœa. The systolic murmur has been becoming more distinct, and it is now plainly audible in any position of the body. During the day the temperature rose to 100°, and he complained of epigastric distress.

4th (27th day). The evening temperature has gone just beyond 100° for the last three days. Pains in the back of the neck and about the shoulders. Flatus in abdomen troublesome.

7th (30th day). Temperature rises to above 100° at night, and last night it touched 101°. Pain on taking a long breath. Orthopnœa. No new physical signs.

8th (31st day). Evening temperature was 102°. Dulness on percussion at the base of the right lung, weakened breath sounds and diminished vocal resonance. At the left base there is a slight loss of resonance. The heart's action is now rapid, the sounds are somewhat muffled. Respiration 24.

9th (32d day). To day a distinct to-and-fro murmur is heard over the præcordium, with its maximum intensity at the junction of the fourth costal cartilage with the sternum on the left side, and it is audib'e at any point within a radius of an inch and a half from here. The limits of cardiac dulness are not perceptibly increased. There is evidently fluid in both pleura, for on both sides of the chest there is now flatness as far up as the angles of the scapulæ; breath-sounds absent. On the left side over the dull area there is very distant ægophony.

10*th* (33d day). The temperature reached its highest (104°) last night. Great restlessness and discomfort. Physical signs unchanged, except that the cardiac dulness is increasing toward the right side, extending to half an inch beyond the right border of the sternum.

He complains greatly of gastric eructations, and the cardiac pain and dyspnœa interfere with sleep.

12*th* (35th day). The temperature has been falling. Cardiac dulness is unchanged, but the to-and-fro murmur is no longer present. Sounds muffled.

13*th* (36th day). The sounds less muffled. A systolic murmur again audible just below the nipple.

18*th* (41st day). There is general improvement. Very slight rise of temperature in the evenings. Ægophony not so well marked. Systolic murmur now very plain.

July 9. Went to his home in the country to-day. From the date of last note he improved very rapidly, especially after he was allowed to move about. When he left the hospital the cardiac dulness was of normal extent, and though the ægophony entirely disappeared, there still remained a margin of dulness at both bases. The systolic murmur presented its old character, being limited strictly to the apex. The urethral discharge gradually disappeared.

Such is the history of the case which carries with it the greater part of the evidence I have to bring before you in favor of the view that gonorrhœal rheumatism may set up cardiac affections. A young man, not personally nor hereditarily disposed to rheumatism, in the fifth week of his second attack of gonorrhœa, is exposed to cold, suffers from a succession of rigors, followed by slight joint pains, chiefly in the knees, not of a character sufficiently severe to confine him to bed. After four days these transient joint pains leave him and he is suddenly attacked with præcordial pain and dypnœa. The physical signs of pericarditis are recognized. Nothing more is heard of the articular pains, but the urethral discharge continues and evidences of pericarditis disappear. On the thirtieth day of the illness fresh effusion takes place in the pericardium, and in the pleura the same process is noticed. Gradual absorption of effused fluid takes place. Finally, all physical signs disappear except a well-marked apex systolic murmur.

Either it was a case of gonorrhœal rheumatism in which the endocardium, pericardium, and the pleura were attacked, or it was an ordinary case of acute rheumatism with ordinary complications, and the gonorrhœa was merely an accidental circumstance. I believe that the gonorrhœa was the cause of the attack on the serous membranes, for these reasons:

1. There was no previous history of acute rheumatism nor of any rheumatic manifestations whatever; no tonsillitis, no chorea, no growing

pains. His mother assured me that up to the present illness he had been perfectly well.

2. The fact of cold having acted as an exciting cause in no way affects the probability of gonorrhœa having been the predisposing cause. In the twenty-seven cases of gonorrhœal rheumatism I have collected cold was put down as the exciting cause in seven, and this is no new observation.

3. Pyrexia was by no means prominent. For the first fourteen days the temperature scarcely went over 100°. At the time the pleurisy and pericarditis were discovered there was elevation, but not at the outset of the disease, as would most probably have been the case in ordinary acute rheumatism.

4. The joints were involved to a very slight degree. He was never obliged to take to bed on account of joint pains, and at the very height of the attack he was still able to walk about. The pain was mainly felt in the knees, and there was no metastasis. The wrists and ankles were merely stiff. We know that in children the joint affection of rheumatism bears no relation to the severity of the heart affection, but in adults one does not commonly see cardiac affections follow joint affections so slight as these were.

5. There was no sweating at any period of the disease.

The conclusions which may be drawn from this paper are as follows:

1. That a review of the literature of gonorrhœal rheumatism shows that although a considerable number of cases have been recorded to prove the connection between gonorrhœa and affections of the serous membranes, yet those histories which will bear close inspection are very few. In some, the actual presence of the heart lesion is open to doubt, and in others the existence of ordinary acute rheumatism cannot be excluded.

2. That although of remarkably infrequent occurrence, cases do occur where the poison of gonorrhœa attacks the endocardium, the pericardium, and the pleura as well as the fibrous structure of joints.

3. That if such be the case it is the duty of physicians to regard gonorrhœa in a more serious light, to confine patients to bed whenever the symptoms are at all severe, to examine more frequently the condition of the heart, and to ascertain in cases of chronic valvular affection where there is no history of acute rheumatism, whether a possible cause may exist in a bygone gonorrhœa.

My thanks are due to my colleagues, Drs. Ross, Wilkins, and Molson of the medical staff of the Montreal General Hospital, for permission to make use of their case-books, as well as to Dr. Vidal, my house physician, for the aid he afforded me in collecting the clinical histories used in the preparation of this paper.

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THE ORGANIZATION OF AN OPERATION.

By W. W. Keen, M.D.,

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Our text-books on surgery, in treating on Operations, give directions as to the need of an ample number of assistants and the assignment and nature of the duties of each, of preparing the room, etc.; but so far as I know, they do not insist on the proper method of organizing the operation as to the minute written or printed directions to the nurse and to the physician in charge in any systematic way. For the want of this the family, the physician, and the nurse do not know what is expected of each, and often the needed preparations are not made until the surgeon arrives in person.

In my earlier professional life, before doing an operation I was compelled to sit down and make a list of what was wanted, and also to give verbal or written directions to the nurse, the family, and the physician. At each operation this laborious process had to be repeated, and the chances were that I would forget some one or more of the details of the preliminary preparation, or some minor instrument or necessary appliance that I wanted during the operation. Gradually the matter systematized itself in my mind, and some twelve or fifteen years ago I prepared a blank somewhat similar to the one presented below. I have been so often asked for a copy of this blank that I have finally decided to publish it in this article, and in addition Messrs. Lea Bros. & Co. have kindly consented to publish the blank in pads of fifty each, so that they may be available to any surgeon who desires to use them. Probably others have adopted some more or less similar plan but I know of none that has been published.

My custom is, before each operation, to take one of these blanks, run over its items and check those that are applicable to the case. I then send or hand it to the physician in attendance, with the request that everything shall be prepared in accordance with it. If it is a private case of my own I hand it to the nurse and expect her to attend to the items of the first two divisions, and I check and so order from the drugstore such appliances, dressings, or drugs of the third and fourth divisions as I require.

OPERATION BLANK.

.... 18

For the operation on M (name and address) on (date) at o'clock, please see that such of the following preparations as are checked are all made beforehand.

....M.D.

I. THE PATIENT.

1. The day before the operation shave the parts; scrub well over a wide area with soap and water; then with ether; then with sublimate solution, 1 : 1000; then apply a sublimate gauze dressing and bandage to remain until the operation.

2. See that the bowels are opened by a gentle purge given the previous evening, and if need be by a morning enema.

3. Wash out the vagina and rectum.

4. For breakfast a cup of clear soup (no bread or other solid food), and no food later.

5. Have the patient in bed (in an adjoining room, if possible) a half-hour before the operation, with night-dress, chemise or undershirt, drawers, and stockings only.

II. The Room and Bed.

1. Take up the carpet, remove curtains, draperies, and all furniture except a bureau, washstand, table, and two cane-seat or wooden chairs; clean the room; clean the walls and ceiling with a brush or broom covered with a towel; then wash the floor, woodwork of walls, and furniture with carbolic solution, 1:40; have clean carpet strips ready to lay on the floor after the operation.

2. A firm four-legged table, with three old blankets and a pillow in front of a window (north light preferred).

3. Remove the window-curtains, and screen the lower sash by paper or towels.

4. Four toilet tables for instruments, dressings, etc.

5. Protect the floor.

6. Two blankets on the bed instead of sheets.

7. Protect the bed by rubber cloth and a draw sheet.

8. Ten hot-water bottles well corked.

9. Hoops to support the bed-clothes.

10. Waste water bucket.

11. Five china basins and one tin basin.

12. Three sheets and fifteen towels, to be wrung out of sublimate solution, 1:1000, the night before the operation and rough-dried.

13. Two dozen large safety-pins.

14. Tumbler, tablespoon, and teaspoon.

15. Nail-brush.

16. Two pitchers of cooled boiled water.

17. Plenty of hot water.

18. A sheet of stout wrapping-paper.

19. 1½ yards white flannel.

20. Fresh clear soup and milk.

21. Olive oil, two ounces.

22. A half-pint of vinegar.

III. Dressings, etc.

1. One can of Am Ende's sublimate gauze.

2. One roll of Hartmann's wood-wool dressing.

3. A piece of "rubber dam"   x   inches.

4. Four bandages,   inches wide.

5. Two ounces borated cotton.

6. ¼ pound of "Globe antiseptic wool."

7. Bed-pan.

8. Catheter.

9. Thermometer.

10. Hypodermatic syringe.

11. A bent glass feeding-tube.

IV. Medicines, etc.

1. Carbolic acid (No. 1). fl℥ vss in a half-gallon bottle of distilled water.
2. Carbolic acid (No. 1), fl℥ vj.
3. Two ½ pound cans Squibb's ether.
4. Chloroform, fl℥ iv.
5. Liq. morph. sulph., fl℥ j.
6. Four suppositories, 1 grain opium each.
7. Spirits ammon. aromat., fl℥ ij.
8. Alcohol, Oj.
9. Ten-grain powders of sulfonal in no. 4.
10. Brandy, fl℥ iv.
11. Lime-water, fl℥ iv.
12. Sublimate tablets for 1:1000 solution, no. xx.

I would like to add a few words in explanation of some of these directions, lest they should be obscure or misunderstood.

Part I.

(4) For the meal before the operation I always prefer a cup of clear soup rather than milk, with no bread or other solid food. My reason for this is that the anxiety which is so common and so natural before an operation frequently disturbs the digestion to such an extent that even milk curdles in the stomach, is not digested, and is often vomited in large curds.

Part II.

(6) As after the operation the patient is apt to be in more or less of a condition of shock and to feel the cold, I always prefer that he shall lie between blankets instead of sheets.

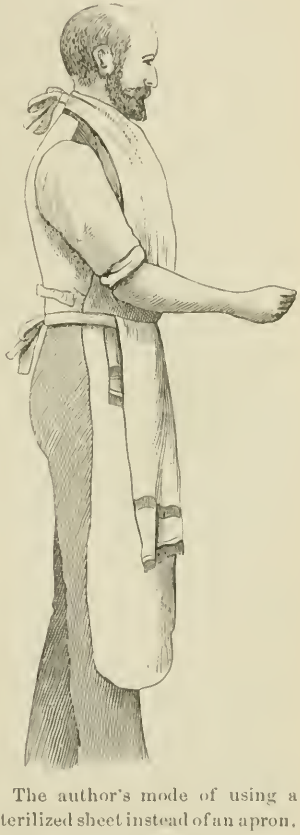
(8) I always order ten hot-water bottles, well corked, three to be placed on each side of the patient, two or three between the legs, and one or two at the feet. After the patient is placed in bed and covered with the blanket these bottles are placed upon the upper blanket, and thus any danger of burning the skin is avoided.

(11) Of the five china basins I use one for washing the hands and forearms before beginning the operation, a second for alcohol to cleanse the hands with, a third for a hot bichloride solution for disinfecting the hands after the alcohol, a fourth (after disinfection) for sponges or their substitute (see below), and the fifth for a hot bichloride solution in which to wash my hands repeatedly during the operation. The tin basin is used in case the patient vomits, and is chosen on account of its light weight.

(12) The three sheets are folded about six feet long and eighteen

inches wide. About a foot of the upper end is turned under, the short end being next the chest, and hanging over a bandage which is tied around the neck. Another bandage around the waist secures the sheet to the body. I use these for myself and two assistants as substitutes for the ordinary aprons or operating-coats. My reasons for this are, first, because they are sterilized, and secondly, it gives me much less trouble to have the nurse look after this than it does to keep several of these coats or aprons and have them constantly washed and sterilized at home.

Fig. 1.



The author's mode of using a sterilized sheet instead of an apron, the upper end being turned next the chest and over the bandage around the neck. The towel and bandages are also sterilized.

The towels, like the sheets, are to be sublimated so as to render them aseptic, and then are dried. I am persuaded that we often add needlessly to the shock of an operation by chilling our patients with the towels wrung out of a hot sublimate solution. These quickly cool, and in at least one, if not two instances, I could trace severe attacks of rheumatism to the use of the wet towels. It will be noticed therefore that the sublimated towels which I use are all dry. The entire field of operation is surrounded by them, and the arm or leg (and sometimes both) next the field of operation is wrapped with these sublimated towels, well secured by safety-pins. If the patient, then, in the ether-struggles happens to touch the part, it is by a disinfected towel rather than an infected arm or hand. Similarly in operations on the head or neck I pin one of these towels around the hair, and I also usually pin one around the inhaler.

(16) I have two pitchers of boiling water drawn on the morning of the operation and allowed to cool, so that I can dilute the hot water extemporaneously to any temperature desired with this cool, sterilized water.

(18) The wrapping-paper is for the purpose of making a hood for the Allis inhaler.

(19) The white flannel is for a binder, and in a breast case I always tear it lengthwise into two strips, each ten or twelve inches wide. One of these secures the dressing to the chest, and the other secures the

arm of the operated side securely to the chest to obtain that essential, physical rest. I pin the two layers of flannel to each other behind the elbow in order to give support to the arm. A sling supports the forearm.

PART III.

(1 and 2) The sublimated gauze that I have found the most satisfactory is that made by Am Ende, of Hoboken, N. J. Any other make or Lister's double cyanide gauze may of course be ordered. I have lately used also with great satisfaction Hartmann's wood-wool dressing. I have had Dr. Coplin, the bacteriological assistant in the Jefferson Medical College Laboratory, examine this bacteriologically, and he has found it absolutely sterile. I rarely use sponges now, but more commonly cut up a half or a whole can of sublimate gauze into masses one-half to two-thirds the size of a fist and use them for sponges, throwing them away of course afterward. They may be used after Landerer's dry method, and even in cases where one does not wish to adopt this as a method I think the gauze mops are much less dangerous than sponges, no matter how carefully they are disinfected.

In the abdomen however I always use sponges, because in cutting the gauze there are apt to be loose threads on the margin which I should be unwilling to leave in the abdomen. The wood-wool dressing I have not found so advantageous for sponging. It may be used, it is true, in little bags of cheese-cloth, but they are more troublesome to make than the simple cutting of the sublimated gauze.

I always use my dressings dry.

(3) The rubber dam is the thin rubber tissue generally used by dentists and known to dealers by this name. Even with sublimate gauze I always use it, not, as in carbolic acid dressings, on account of the volatility of the antiseptic, but to prevent the soaking through of the discharge at the points opposite the drainage-tubes. The size of the rubber dam is suited to each case.

(6) Outside of the rubber I ordinarily use a mass of "Globe antiseptic wool." I find it the best means of securing an equable and elastic pressure.

PART IV.

(1) The solution of carbolic acid is a little more than 1 : 10, and is made of this strength in order that it may be extemporaneously diluted with hot water for the instruments. These I place in one or more tin trays and cover them as soon as I arrive with the carbolic acid solution diluted to 1 : 20. Just before beginning the operation, after they have been soaking ten to twenty minutes, I pour off all this solution and cover them with boiling water. By this means they are thoroughly disinfected, and at the same time the substitution of the boiling-water

prevents the destruction of the epidermis of my hands, which is one of the great objections to carbolic acid. The extra carbolic acid is to make more of the solution if desired, and as I always order the carbolic solution in a half-gallon bottle it can be made extemporaneously with sufficient accuracy. Scrubbing the hands with ordinary vinegar is the best means of removing blood, and neutralizes excellently any disagreeable effects of the carbolic acid. I owe this suggestion to Miss Dalziel, of the Orthopædic Hospital. In the Jefferson Hospital and elsewhere where I have a Schimmelbusch sterilizer I always use this instead of soaking the instruments in the carbolic solution, but in operations in private houses I find the carbolic acid more convenient and equally efficient. In the Jefferson Hospital we have also a Sattegast steam sterilizer for sheets, towels, gauze, etc., to be used instead of sublimating them. The Arnold sterilizer answers admirably also for this purpose and is much cheaper than the foreign makes. The largest size should be ordered. It is made of copper and costs $10. A croup attachment comes with it.

(5 and 6) While I frequently order morphine and opium suppositories lest they be needed the night following the operation, as a matter of fact I very rarely have to use them. Antisepsis has almost abolished pain after operations, even the major ones.

(8) The alcohol is for the purpose of washing the hands and scrubbing the finger-nails after they have been cleansed with soap and water, and before cleansing them with the bichloride solution.

(9) I often give one or two ten-grain sulfonal powders the night before the operation, to overcome the natural apprehension a patient often feels and so secure a good night's sleep, and afterward, also, if necessary.

(14) The sublimate tablets are familiar now to the profession, and are by far the most convenient form of making extemporaneously the ordinary solution of 1 : 1000, or any other desired strength.

If the nurse understands her business as she ought, and follows the directions given, all the preparation will be made—the room and table all ready, the wrappers taken off the bottles, the corks sufficiently loosened, the lids of the cans of gauze loosened, and everything will be so arranged that the surgeon has only to prepare his instruments, needles, sutures, and gauze-sponges, and is ready to proceed without any loss of time to himself, his assistants, or his guests.

INSTRUMENTS.

In order that I may not forget any instrument or appliance, even the most trifling, I have made out for my own use the appended manuscript list of instruments, etc. Before an operation I run over each item, first in the "general list" of instruments, etc.; secondly, the list of instruments for the especial kind of operation to be done, and lastly, the "special list" of instruments. This requires only a few minutes, and by it I am reminded always to see if any instrument or appliance has been omitted, and if the stock of such as are used up (silk, catgut, drainage-tubes, etc.) is exhausted, I am reminded to replenish it.

General List of Instruments, etc.

1. General operating-case.
2. Allis's inhaler.
3. Tongue-forceps.
4. Cocaine solution, 4 or 10 per cent.
5. Hemostatic forceps.
6. Retractors.
7. Sponges—ordinary size; elephant ear; small.
8. Sponge-holders.
9. Silk; catgut; iron and silver wire.
10. Drainage-tubes—rubber; glass.
11. Horsehair for drainage.
12. Sharp spoons.
13. Volsella.
14. Paquelin cautery.
15. Fountain syringe.
16. Large tin pans; small rubber pans.
17. Trocars
18. Long probes.
19. Long hemostatic (pedicle) forceps.
20. Photographic apparatus and shutter.
21. Electric battery and lights.
22. Forehead-mirror.
23. Rubber pad.
24. Aspirator.
25. Esmarch's bandage: tourniquet.
26. Iodoform-dredger.
27. Splints.

Instruments for Operation on the Brain and Spine.

1. Brain case of instruments.
2. Rongeur forceps.
3. Horsley's or other Rolandic fissure meter.
4. Broca's calipers.
5. Thermometer.
6. Müller's fluid.
7. Bottle for cerebro-spinal fluid.
8. Bottles for specimens.
9. Opium and ergot to be given beforehand.
10. Faradaic battery.
11. Keen's double brain-electrode.
12. Battery and electric light.
13. Iodoform-gauze.
14. Canula and hollow needle.
15. Decalcified bone.
16. Aniline pencil.
17. Rat-tooth forceps for dura.
18. Horsley's putty for hemorrhage from bone.
19. 1 : 2000 gauze.
20. Plain sterilized gauze.
21. Skull and Cast of brain.

Operations on the Mouth and Throat.

1. Special case of instruments.
2. Intubation-case.
3. Oral specula, gags, and retractors.
4. Stick sponges.
5. Special needles.
6. Volsella for tonsils.
7. Tonsillotome.
8. Long forceps.
9. Snare.
10. Tracheotomy tubes and tapes.
11. Feathers.
12. Long curved forceps.
13. Harelip pins.
14. Tracheal tube (Trendelenberg's or Hahn's).
15. Trachea dilator

Instruments for Abdominal Operations.

1. Count instruments and sponges before operating and again before closing abdomen.
2. Trocars.
3. Ovarian trocar and tubing.
4. Pedicle silk.
5. Senn's bone plates and Abbe's catgut rings.
6. Tube for washing stomach.
7. Long hemostatic (pedicle) forceps.
8. Abdominal retractors.
9. Koeberlé's serre-nœud and pins.
10. Enterorrhaphy needles and silk.
11. Elastic tubing.
12. Intestinal clamps.

Instruments for Operation on the Male Genito-urinary Organs.

1. Catheters.
2. Bougies and filiform bougies.
3. Sound.
4. Urethratomes and dilators.
5. Urethrameters.
6. Metal or rubber syringe, to inject air or fluid into bladder.
7. Lithotrites.
8. Litholaplaxy set.
9. Stone forceps and scoops.
10. Staffs (urethral and perineal).
11. Crooked scissors.
12. Watson's perineal drainage-tube and rubber tubing.
13. Long hemostatic (pedicle) forceps.
14. Snare.
15. Petticoated tube.
16. Modeller's clay.
17. Saucer.
18. Cocaine.
19. Keen's special retractor for suprapubic cystotomy.
20. Forceps and écraseur for tumors.
21. Petersen's bags.
22. Solution for bladder.
23. Cystoscope and battery.
24. Abdominal electric light.
25. Dalley's steel nail.
26. Catheter for ureter.
27. Arrange for Trendelenberg's position.
28. Ureteral catheters.
29. Perineum distender.

Instruments for Operation on the Female Genito-urinary Organs.

1. Special case of instruments.
2. Specula.
3. Stick sponges.
4. Special needles.
5. Perineum distender.
6. Long hemostatic (pedicle) forceps.
7. Hawk-bill or toothed scissors.
8. Snare.
9. Uterine sound,
10. Uterine clamp.
11. Uterine dilators.
12. Uterine curettes and forceps.
13. Strong rubber cord.
14. Trocars.
15. Long probe.
16. Crooked scissors.
17. Urethral dilators.
18. Petersen's bags.
19. Pedicle silk.
20. Abbe's catgut rings for lateral anastomosis.
21. Silk and needles for enterorrhaphy.
22. Koeberlé's serre-nœud and pins.

Operations on the Rectum.

1. Stick sponges.
2. Rectal specula.
3. Perineum distender.
4. Rectal bougies.
5. Forceps for piles.
6. Snare or écraseur.
7. Todd's rectal dilator.

Operations on Bones.

1. Case of bone instruments.
2. Esmarch's bandage.
3. Sharp spoons.
4. One-half inch trephine.
5. Surgical engine and drills.
6. Hand-drills and stout wire.
7. Special splints.
8. Suspension apparatus.
9. Plaster-of-Paris and plaster bandages.
10. Flannel.
11. Decalcified bone.
12. Sand-bag.
13. Adams's saw.
14. Macewen's osteotomes, chisel, and mallet.
15. Mastoid perforator.

Special Instruments.

1. Special case of instruments for each operation.
2. Iodoform in ether and syringe.
3. Rubber adhesive plaster.
4. Davies' lever or long skewer.
5. Bullet-forceps.
6. Nélaton's probe.
7. Tenotomes.
8. Plaster-of Paris bandages and plaster.
9. Morris's kidney-retractors.
10. Sand pillow for nephrorrhaphy or osteotomy.
11. Lithotomy forceps for nephrolithotomy and cholecystotomy.
12. Œsophageal bougies.
13. Bellocq's canula.
14. Mastoid perforator.
15. Special splints.
16. Instruments for gall-bladder and gall-stones.

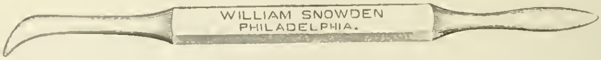
I add a few words of explanation as before.

In my operating-satchel I always carry a small general operating-case with the instruments ordinarily required. I need not enumerate them, for each surgeon will follow his own desires and the necessities of his kind of work. I may mention, however, a few which I have found especially useful.

I almost always use the Hagedorn needles, an assortment of which I carry in a small bottle in carbolized glycerin. For these I have found by far the best needle-holder to be that of Abbe, of New York, with McBurney's spring catch on one blade of the handle. I have found the little "Tweed dropper" the most useful in etherization. It fits into any one of Squibb's ether cans, and thus avoids the necessity of carrying any ether bottle.

I have always found it an economy of space to have two of my scalpel handles tipped with Volkmann's sharp spoons. Another instrument I have, which is not generally known to the profession, is Dr. Allis's "dry dissector," for tearing tissues and separating muscles, loosening adhesions, scraping away the periosteum, etc. I find this one of the most useful instruments in my case. Instead of this I very often use two dissecting-forceps—one in each hand—one to seize and the other to tear the tissue, and have found them more useful by far than seizing the tissue with a pair of forceps and tearing with the grooved director or finger, though each of these means serves a good purpose at times.

Fig. 2.



Allis's dry dissector. Half-size. The two blades are just thick enough to be strong.

I carry a few sponges in a glass-stoppered bottle in a carbolic solution, though I rarely use them now. In another bottle, in the same solution, I have some rubber drainage-tubes, silk, etc.; and in another smaller bottle, again in a carbolic solution, some disinfected horsehair for drainage. The horsehair is first washed well with soap and water, then with ether to dissolve the fatty matters, and then is disinfected in 1 : 1000 sublimate solution before being placed in the bottle. In addition to a nest of three large tin pans I carry a small rubber pan, such as photographers use, and place my needles, needle-holders, ligature-reel, and sutures in that.

INSTRUMENTS FOR OPERATION ON THE BRAIN AND SPINE.

(11) My double brain electrode is figured in *Wood's Reference Handbook*, vol. viii. page 212, but the disinfected metal ends of the ordinary battery cords answer very well.

(18) Horsley's putty for hemorrhage from the diploë is made as follows: Melt repeatedly one part of yellow wax and four of vaseline. Next add carbolic acid, one part to twenty of the wax and vaseline, and mix intimately. Then add sufficient white wax to make a mass that will be hard when cold, but that can be quickly softened by the fingers. With this (kept disinfected, of course) he "putties up" the vessels in the edge of the bone.

(19, 20) The 1 : 2000 gauze I always use to the head before head operations instead of the 1 : 1000, because I have found that the 1 : 1000 pustulates the scalp, which the weaker gauze does not do. Plain sterilized gauze I always provide for use as sponges as soon as the brain is exposed, as the antiseptic lessens or destroys he irrit ability of the brain to the Faradaic current.

(21) I always have a skull and a cast of the brain for reference during an operation.

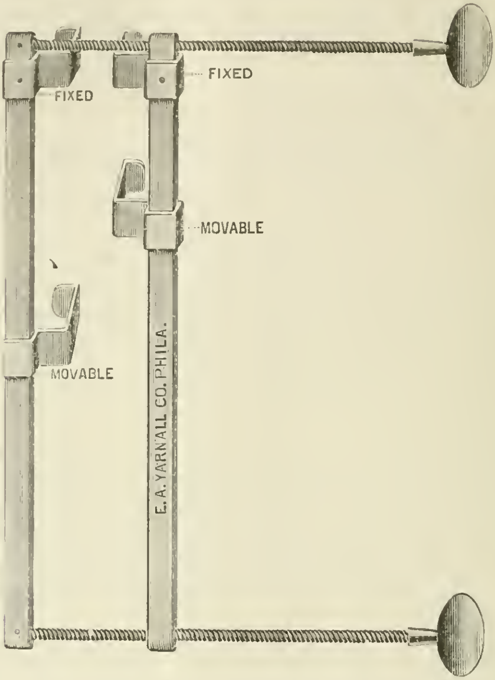
INSTRUMENTS FOR OPERATIONS ON THE MALE GENITO-URINARY ORGANS.

(19) My special retractor (see illustration on page 22) I have recently devised and used with great satisfaction in one case. The very day I had it made I saw in the *Lancet* of October 18, 1890, p. 809, an instrument of Dr. Watson, of Boston, for the same purpose. My own has, I think, the advantage that its force is better regulated than by a spring, and as two of the jaws are movable it may be used in the abdomen or elsewhere, and with varying sized openings.

Some instruments, etc., will be found duplicated in the lists, because I especially desire not to forget them.

Mr. Mayo Robson, of Leeds, has recently published a little volume of 52 pages, entitled *Instruments and Appliances Required in Operations* (London: Churchill, 1889). In this there is a list of instruments, dressings, appliances, etc., required in each operation. It will be found much more complete, of course, than my own. But I have found practically that a list covering the instruments required in each class of operations, together with the general list and the list of special instruments to be quite sufficient for my purpose.

Fig. 3.



The author's retractor for supra-pubic cystotomy, abdominal sections, etc., when needed.

My own method also has one essential advantage. In using Robson's book the surgeon has to write out all his directions each time for the nurse, for drugs, etc. By my blanks the surgeon tears one off from the pad and has only to check what he wants done in parts I and II., and hand it to the nurse, and check what he wants in parts III. and IV. and send it to the drug-store after adding his signature, the name and address of the patient, and the date. It is a great economy in time and trouble. He then looks over the lists of instruments, etc., and selects what he wants.

THE MODERN TREATMENT OF SCIATICA.

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It has appeared to the writer not a little strange that the affection which forms the subject of this paper should have been so long a term of reproach to the profession. The subject has great relative importance. The domain of sciatica is a broad one, for, although it is to a certain degree modified by climatic influences and hygenic environment, it is common to all countries. No distinctions of class are recognized, the prince and the pauper suffering alike, and the suffering in many instances is without a parallel in medicine. In not a few examples, the disease has produced a condition of physical disability which has rendered the patient absolutely helpless and a burden to society. Here are factors, one would think, sufficiently numerous and important to have led to such earnest and conscientious study of the subject as would have given scientifically accurate results in diagnosis and treatment long ago. It is only, however, within recent years that we have learned to differentiate sciatica from rheumatism and gout, and our knowledge of the pathology and consequent rational therapeutics of the disease is of much more recent date. The etiology of the affection has been, for many years, fairly well understood, a statement which is also true of the clinical history, though much new light has been thrown upon the latter phase of the subject by recent investigations of peripheral nerve diseases. This knowledge is the outcome of a study of the pathology involved, the only field in which investigations lead to accurately scientific results.

The birth of the literature of peripheral nervous diseases may be said to date from the beginning of the present decade, and to Leyden probably belongs, more than to any one else, the credit of first establishing the subject upon a scientific basis. Multiple neuritis as a distinct entity in medicine, owes its recognition by the profession to a description given by Leyden in a paper published in 1880. This was followed by a series of investigations, carried out by Pitres and Vaillard,[1] the results of which, as published from time to time, embody about all of practical importance which we know of the diseases of the peripheral nervous system. Much additional and valuable information has been gathered, also, through the investigations of Erb,[2] Remak, Babinski, Adamkiewicz, and others, and though the subject has not yet been entirely elucidated, we know much that was not even suspected ten years ago, and our knowledge is increasing daily. Although not directly the object of most of these investigations, sciatica has been found incidentally to exemplify many of the pathological conditions which have been observed. As a result we have (besides the overthrow of the delusion of identity of rheumatism and gout with the disease in question) two distinct conditions of disease, often clearly demonstrable clinically, instead of the one indefinite and poorly understood symptom-group. In other words, we have to-day to deal with sciatic neuritis on the one hand, and sciatic neuralgia on the other. The importance of the distinction may be appreciated when it is stated that both prognosis and treatment depend upon its recognition. Incidentally, and as corollary to the above, it may be added that the reputation of the physician in attendance is also involved.

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[1] Pitres and Vaillard: Gaz. Médécine de Paris, 1887; Revue de Méd., 1887.

[2] Erb: Neurolog.-Centralblatt, 1883.

The establishment of the fact that true neuritis is the pathological condition in certain cases of sciatica, has led, as might have been expected, to the belief on the part of many, that it is the *only* condition ever present. With such it is believed that the essential factor is always of an inflammatory character, and that the difference in clinical symptoms depends only upon the degree of inflammatory action. While there is much to support this view, I am one of those who believe that there are cases which must be still classed as neuralgic, rather than neuritic. There are certainly two very distinct clinical types to be met with, and it is difficult to reconcile them to a common pathology. In order to illustrate the difference, according to the type present, I append the following symptom-groupings, which will also serve for purposes of differential diagnosis.

Sciatic Neuritis.	*Sciatic Neuralgia.*
Causes: Wounds and tumors indicate neuritis rather than neuralgia.	Etiology same, except that constitutional states—as anæmia, malaria (?)—indicate neuralgia, unless bilateral.
Pain duller; occurring in paroxysms, and in intervals, paræsthesia of pricking, tingling and numbness.	Pain sharp and more constant. Paræsthesia rare, especially numbness.
Movements of limb, especially forcible extension, give pain.	Pain not specially aggravated by movements, if at all affected.
Anæsthesia rapid in onset at times and in limited areas.	Actual anæsthesia very rare. General numbness may occur.
May be swelling along course of nerve and tenderness on pressure.	No swelling. Pain, not tenderness, on pressure at certain points.
Trophic changes in skin, hair and nails. Trophic wasting of muscles.	No trophic changes. Slight wasting may occur from disuse.
Paresis or paralysis of muscles, with reaction of degeneration to galvanic current, may be present.	No paresis or paralysis. No reaction of degeneration.
Faulty position of body (Babinski, Nicoladoni) sometimes observed.	Faulty position quite exceptionally met with.

As with every other disease, classical types in sciatica are the exception, but sufficient data may be secured in nearly all cases to enable you to reach an approximately correct diagnosis as to the special form you may have to deal with. A loss of tactile perception is always strongly suggestive of neuritis, while paresis or paralysis, with the reaction of degeneration to the galvanic current in the affected nerve, is positive evidence of a nerve degeneration. The pathological conditions found are sufficient to account readily for the symptoms, and the variations in intensity of the same. The neuritis, if the case is such, may be either parenchymatous or interstitial.[1] The perineurium may be alone affected, or the nerve-fibres may be pathologically altered from inflammation or pressure. The usual process is that of ordinary inflammation following some such excitant as trauma or cold, giving rise to vascular engorgement, with the outpouring of leucocytes and a succeeding proliferation of interstitial tissue. These morbid products fill up the nerve-sheath and by pressure destroy the sheath of Schwann, set up a degenerative process in the axis-cylinders, finally producing a sclerotic condition of the nerve-fibres or completely destroying them. The intensity and extent of the symptoms will, of course, depend upon the extent and activity of the inflammatory action. Such is the pathology of sciatic neuritis. In a certain number of cases, however, no such conditions are found, and, indeed, section and examination of the nerve reveals nothing, either macroscopically or microscopically, which will account for the symptoms. We are compelled, while acknowledging that future investigations may show that such cases belong to the type described above, to class them differently for the present, and I know no better term for the condition than neuralgia. While an acceptance of the term involves a begging of the question from a pathological standpoint, we are not yet in a position to dispense with it. Except that it is supposed to involve a state of nerve irritability, dependent upon trophic influences or altered nutrition, etc., neuralgia may be said to be without a pathology.

I shall not consider the clinical history or differential diagnosis of the disease any further, assuming the existence of a general familiarity with both divisions of the subject. With regard to the identification for many years of sciatica with rheumatism and rheumatic states, I find it difficult to understand how such an association came to be so generally accepted.[2] The clinical symptoms differ widely, and in an experience with more than sixty cases, treated during the past three years at the Department of Nervous Diseases of Prof. Landon Carter Gray in the New York Polyclinic, I have found the so-called "anti-rheumatic" remedies exceptionally curative in sciatica.

The modern treatment of sciatica, based upon an enlightened pathology, represents a revolution in therapeutics, and varies radically with the type present. While many of the drugs and measures in use in former years are still indicated in the neuralgic type, the pharmacopœia of sciatic neuritis is an entirely new one. A summary of the most reliable of the modern anti-neuralgic and analgesic remedies will include phenacetine, antipyrine, antifebrin or exalgine, cocaine and osmic acid, the last two used hypodermically alone. Of these, phenacetine is by far the most reliable and satisfactory. Doses of seven and a half grains, given at four- or six-hour intervals, I have found quite effective, though larger quantities may be given with perfect safety, if necessary. Exalgine I have found, after repeated tests, very unreliable. With osmic acid, recommended in America by S. Solis-Cohen, in ten-minim doses of a one per cent. solution hypodermically, I have had little experience. It is, of course, advisable to antagonize by proper medication any cachexia which may be present, and tonics, including change of air, will be found of value in all neuralgic states. A combination of iron, quinine, and arsenic, is a common formula, and answers quite well.

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[1] Starr: Middleton-Goldsmith Lectures. Med. News, 1887. Erb: Ibid. G. Hammond: Journal Nervous and Mental Diseases, May, 1890.

[2] Pitres and Vaillard found nerve degeneration following rheumatic deposits as a cause, but the cure of the rheumatism in such cases does not cure the neuritis: Revue de Méd., 1887. See also Duplaix: Gazette des Hop., 1887.

It is in the treatment of neuritis of the sciatic nerve that we have to note the most radical innovations in therapeutics, and the greatest advancement in results. It is of primary and essential importance in these cases to look for and, if possible, remove the cause. This may be either mechanical and local, or constitutional. Among the local causes may be mentioned, in addition to wounds, strains and hip-joint disease, tumors of the pelvis, fæcal accumulations, uterine displacements, varicose veins and aneurisms. Exposure to cold may also be cited as a local excitant, though it probably acts in a double capacity. Toxic conditions of the blood give rise to a local neuritis occasionally. Lead and arsenic among the metals, diabetic states, alcoholism, syphilis, and certain microörganisms, as in malaria, have been cited as causes. Bury, in an article published in 1888 in the *Manchester Medical Chronicle*, called attention to the frequent development of neuritis in association with tubercular phthisis and typhoid fever. Thrombic occlusion of a local bloodvessel may be the explanation in some of these cases.[1] Removal of the cause, where the relationship is clear, is at times all that is necessary in the line of treatment. If this is not determinable, the treatment resolves itself into three cardinal principles—the relief of pain, the antagonizing of inflammation, and absolute rest of the part. Of these three, the last is most important. The patient should not only be put to bed and kept there, but he should be mechanically restrained from exercising the functions of the diseased nerve. This can be best accomplished by applying a splint,[2] preferably a long hip-splint, extending from the axilla to the foot, so adjusted to the side of the body and leg as not to interfere with local treatment along the course of the nerve. The splint should be worn until the symptoms have disappeared or until the disease has passed into a chronic state, which is rare to-day in comparison with its former frequency. Inflammation is best antagonized by cold applications in the form of rubber bags filled with ice. In the few cases in which cold acts badly, hot applications may be substituted. They should never be alternated, however. This treatment, with morphine to relieve pain, is all that is necessary in the first stages. After the acute stage has passed, the cold applications may be dispensed with. Your active inflammation has subsided, and you have to deal with the mechanical effects produced by the morbid products of inflammation within the nerve-sheath. To hasten the absorption of this irritating material massage will be found most valuable. The manipulations should be gentle at first, once or twice daily, and continued from fifteen to thirty minutes. It is here that electricity finds its place by reason of its catalytic and alterative action. Galvanism is the form indicated, and the entire nerve should be included in the action of the current, which should be continuous, never interrupted. The *séances* should be short at first, and the quantity used should not exceed five milliampères or less. Should the case manifest any tendency to develop a chronic state, the current should be increased, or it may be interrupted slowly, for its stimulating effect. The interrupted current should, however, be used in these cases with extreme caution.

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[1] Pitres and Vaillard conducted a series of experiments with hypodermic injections of ether and other agents along the course of the sciatic and other nerves, producing thereby a rapidly developing form of neuritis. The possibility of such a result should always be considered in using any irritant drug in the neighborhood of nerve trunks by hypodermic injection: Gazette Méd. de Paris, 1887.

[2] S. Weir Mitchell, M.D.

I have found little benefit from so-called specifics in this form of sciatica. Turpentine, nitrate of silver, sulphur, cocaine, etc., have been monotonously disappointing. Iodide of potash, while theoretically indicated, has proven of little value in my experience except in one case in which there was a distinct specific history and cachexia. In this particular case, the recovery of the patient I attributed as much to the inunctions of mercury used as to the iodide.

Counter-irritants, while markedly beneficial in a small proportion of cases, are not at all certain. Nerve-stretching I believe to be absolutely valueless and a dangerous procedure, while in two instances in which section of the nerve has been done, in one the relief was only partial, the other not being benefited at all, while in both cases a semi-paretic condition remained more or less permanently.

New York, 355 W. Fifty-eighth Street.

NOTES ON SIX CASES OF PERINEAL SECTION; WITH SOME REMARKS ON THE TECHNIQUE OF THE OPERATION.[1]

By J. William White, M.D.,

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There has always been more or less confusion in the nomenclature of the perineal operations for the relief of stricture. The old *boutonnière* operation (of which the so-called "Cock's operation" is a modification) had for its object the opening of the urethra behind the obstruction, was purely palliative, and if it ever effected a cure did so by accident, as the procedure itself did not include of necessity any division or enlargement of the strictured portion of the canal. It is an "external urethrotomy," to be sure, but it is not related either in its purpose or its method to the other operations known by that name.

Since Syme revived and popularized the formal operation of external urethrotomy—the division of a stricture upon a grooved staff passed through it into the bladder—more system has been introduced into the terms employed, but there is still much objectionable looseness. Hunter, Grainger, C. Bell, and others had, before Syme's time, formulated the operation known as "perineal section," which was also an external urethrotomy, but which was then restricted to those cases in which no instrument whatever could be made to pass the stricture. The term should still be reserved for such cases, and on account of its brevity is, perhaps, preferable to its synonym, "external perineal urethrotomy without a guide."

The cases which follow belong exclusively in this category—*i. e.*, are all cases of perineal section, and do not include any cases of external perineal urethrotomy. They were all performed during acute retention of urine, which resulted in two from recent complete rupture of the urethra; in two from traumatic stricture following old and presumably incomplete rupture; in one from very old neglected strictures and recent false passage; in one from stricture and false passages, both of many years' duration. Such cases are so frequent in the practice of every hospital surgeon that I shall summarize them as briefly as possible, my object in reporting them being chiefly to call attention to certain details of the operation, and to invite discussion upon them.

Case I.—E. C., æt. forty-four. Cause and duration of obstruction: five attacks of gonorrhœa twenty years ago. Urinary symptoms for fifteen years.

Condition when first seen: Urinating in drops every fifteen or twenty minutes, with tenesmus. Bladder distended; free bleeding from recent attempt at catheterization. False passage, beginning just anterior to the triangular ligament and running between prostate and rectum. No instrument could be passed.

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[1] Read before the American Association of Genito-urinary Surgeons, 1890.

Date of operation: October 30, 1889.

Details of operation: False passage filled with filiform bougies. Syme's staff passed down to membranous urethra. Perineum opened on point of staff. Urethral walls held asunder by silk threads. Clots turned out from false passage. Firm fibrous stricture, easily recognized. No probe would pass through it. Urethra posterior to it, dilated to the size of the thumb, was opened and flat grooved director was passed into the bladder. The stricture was freely divided; a large sized Nélaton catheter was passed through whole length of urethra into bladder and left *in situ*. An attempt at suturing the urethra failed, on account of lack of material at seat of stricture. Wound packed with iodoform gauze. No serious difficulty met with.

Time of operation: Thirty-five minutes.

Subsequent course of case: Uninterrupted recovery. Catheter removed in six days. Regular catheterization every four hours begun on the fifteenth day. Wound healed entirely on the thirty-seventh day.

Calibre of urethra at date of discharge: Patient passes No. 31 French sound easily.

Case II.—W. K., æt. fifty-five. Cause and duration of obstruction: Gonorrhœa in 1862 and 1863. Urgent urinary symptoms for six months.

Condition when first seen: Absolute retention. Bladder up to umbilicus; perineum and scrotum distended with urine, brawny and discolored. Moderate degree of shock. No instrument could be passed.

Date of operation: November 17, 1889.

Details of operation: Syme's staff introduced and cut down upon. Perineum filled with old plastic lymph, partially organized and of almost cartilaginous density. Urethra almost obliterated for three-quarters of an inch posterior to the bulb. Field of operation obscured by extremely free oozing from dilated vessels, which, imbedded in the lymph, seemed to be kept patulous. Urethra finally found near apex of prostate; flat director passed into bladder.

Tissues in course of urethra which could not be recognized as a distinct canal between the bulb and the prostate were freely divided; Nélaton catheter No. 26 French was passed and tied in.

No attempt at suture was made. Wound packed with iodoform-gauze.

Time of operation: Seventy minutes.

Subsequent course of case: Tedious convalescence, on account of condition of perineal tissues. Catheter removed in fourteen days. Catheterization begun in twenty-four days. Wound closed on forty-eighth day

Calibre of urethra at date of discharge: Patient passes 32 French easily.

Case III.—J. B., æt. thirteen. Cause and duration of obstruction: Rupture of urethra from fall astride the sharp edge of an upturned empty barrel nine years previous.

Condition when first seen: Very frequent urination. Only partial evacuation of bladder. Some straining. Urine loaded with pus; a few granular and hyaline casts. Patient pallid and emaciated. No instrument could be passed.

Details of operation: Urethra opened on Syme's staff. A long and tedious dissection failed to disclose opening of stricture. Canal opened at base of prostate. Intervening tissues divided. Nélaton No. 15 French left in bladder. Wound packed. No suture.

Time of operation: ninety minutes.

Subsequent course of case: On the seventh day had orchitis of right side; at end of second week had rigor, followed by fever. Subsequently had frequent attacks of pyrexia, with exceedingly high alternating with subnormal temperatures. Urine loaded with pus. Pain over left kidney. No relief from any form of treatment. Diagnosis: Pyelitis. Exploratory nephrotomy recommended, but refused by parents. Patient passed from notice with small perineal fistula still discharging.

Calibre of urethra at date of discharge: No. 15 French passed easily.

Case IV.—L. N., æt. forty. Cause and duration of obstruction: Fell astride of an iron girder twenty-four hours previous.

Condition when first seen: Absolute retention; great distention of bladder; free bleeding from meatus; perineum and scrotum swollen and infiltrated. No instrument could be passed.

Details of operation: Median section of perineum. Large quantities of blood and urine escaped. Scrotum incised with same result. Catheter passed through meatus protrudes into wound, and a complete rupture of the urethra is found extending through the so-called bulbous portion —the posterior part of the spongy portion.

A long search for the posterior portion failed to find it, until by pressure upon the pubes a jet of urine was made to appear in the wound, and led to the discovery of the proximal end twisted upon itself, retracted, and resembling the end of a large artery which had undergone torsion. A director was first passed through it into the bladder. Then an English gum catheter was passed for the whole length of the urethra. It was found, by moderate traction, that the two ends could be brought into contact. They were then united by six interrupted sutures of very fine chromicized gut, which resists absorption for two or three weeks. The sutures were passed through the entire thickness of the urethra. A large rubber drainage-tube was then laid in the wound, the inner end of the tube opposite the point of junction. The angles of the perineal wound were then united by deep silver sutures, and the centre gently packed around the drainage-tube.

Time of operation: One hundred and twenty minutes.

Subsequent course of case: No fever; no pain. Urine possibly appeared through perineal wound for three days, but in such small quantity that it was uncertain. None later than that. Catheter removed on ninth day, but passed gently every four hours. Drainage-tube removed on twelfth day. Perineal wound healed solid on twentieth day. Patient urinated in a full stream at this time. Went home on twenty-fifth day.

Calibre of urethra at date of discharge: Passing No. 30 steel sound easily and painlessly for himself.

Case V.—J. W., aged seventeen. Cause and duration of obstruction: Climbing from the roof of an out-house fell astride a fence thirty-six hours previously.

Condition when first seen: Retention. Urethrorrhagia. Bladder abnormal. Perineum distended. No instrument could be passed.

Details of operation: Median incision. Complete rupture of membranous urethra; posterior portion of urethra promptly found by bimanual pressure, one hand on the hypogastrium with fingers of the other in the rectum. A portion of bruised proximal end cut off with scissors to obtain good material for sutures; five chromicized gut sutures passed so as to unite urethra over an English gum catheter No. 20. Drainage-tube laid in wound, which was united at angles and packed in centre with iodoform-gauze.

Time of operation: Forty minutes.

Subsequent course of case: No fever. No pain. No appearance of urine in wound. Catheter removed on the fifth day on account of vesical irritation. The next day a few drops of urine came through the perineal wound. Catheter was used every four hours. No further leakage occurred. Drainage-tube was removed on ninth day. Wound healed solidly in two weeks, patient urinating freely and painlessly on the seventeenth day. Went home in three weeks.

Calibre of urethra at date of discharge: Passing No. 22 steel sound easily.

Case VI.—P. M., aged thirty-three. Cause and duration of obstruction: August, 1889, fell into a trench fourteen feet deep, alighting astride a plank. Had symptoms of incomplete rupture of the urethra. Retention relieved by catheterization. In October retention again and formation of extensive false passage during attempted catheterization.

Condition when first seen: Retention. Passing large quantities of blood from the meatus in the form of clots. Bladder much distended. Shocked. No instrument could be passed.

Details of operation: Median incision on Syme's staff passed down to obstruction. Enormous quantity of clot turned out of perineum. Bimanual pressure caused the protrusion of a clot from a portion of the urethra back of the seat of the original injury, which was near the prostato-membranous juncture. The stricture was divided on the floor of the urethra, a large catheter passed and then the tissues brought together by a continuous catgut suture uniting the edges of the incision, which was parallel to the long axis of the urethra. Drainage-tube and packing as in the other cases.

Time of operation: Sixty-five minutes.

Subsequent course of case: No fever. No pain. Urine came through wound for five days. Catheter withdrawn in ten days. Bladder emptied by Nélaton catheter every four hours for four days. Drainage-tube withdrawn on the fifteenth day. Wound healed solidly on the seventeenth day, patient urinating naturally in three weeks. Went home on the twenty-seventh day.

Calibre of urethra at date of discharge: Uses No. 31 steel sound easily.

In cases of extravasation of urine following rupture it has been thought that some light could be thrown by the history of the accident upon the probable situation of the injury.

Franc, Velpeau, and Poncet have attributed the urethral laceration to the crushing of the membranous portion of the urethra between the offending body and the lower border of the pubic arch. If the accident occurred with the patient in a leaning position, the body directed forward, they believe that the posterior part of the spongy urethra could be crushed against the pubis; and think that when the force that produces the injury acts in the lateral direction the urethra is more probably pressed against the upper portion of the descending pubic ramus. Ollier refers lacerations of the membranous urethra to the pressure of the canal against the sharp edges of the subpubic ligament, which in his experiments seemed to have divided the upper wall of the urethra. Terrillon believes that when the body which is fallen upon is narrow the urethra is crushed against the ramus of the pubes, and thinks the injury is likely to be found about the region of the bulb; and when the fall is upon a broader substance, the urethra is crushed against the anterior surface or inferior edge of the pubes and the lesion is found more anteriorly. Guyon says that in this accident, whether the cause is a fall or blow, the mechanism is the same; the urethra and the soft parts which immediately surround it are pressed and crushed against the resisting pubic symphysis, whilst the superficial tissues, more supple and more elastic, escape or are scarcely involved. He believes, as does Terrillon, that such ruptures are frequently only partial, and that they are commonly situated in the spongy part of the urethra, an inch or less in front of the anterior layer of the triangular ligament, and in this opinion he is supported by Iversen, who has recently analyzed twenty-nine cases of this accident. Duplay thinks that in a certain proportion of cases the urethra is ruptured by a temporary dislocation of the symphysis pubis, the soft bones springing back into their proper relation after the crushing force is removed, and leaving no trace of the accident except the urethral lesion.

He thinks that this "rupture by traction" may also occur in a case of fracture of the pelvis with a displacement of a portion of the pubic arch; and it is of course evident that the urethral wall could be wounded directly by a fragment of bone after such a fracture.

In my own experience the history of the case has been of but little value in determining the seat of laceration, which could be better estimated by the character and limitation of the extravasation.

The urethra may, for example, be divided into four regions. In all that part from the meatus to the scrotal curve extravasation is accompanied by a swelling and discoloration of the penis, greatest in the immediate neighborhood of the injury.

In the region included between the attachment of the scrotum and the anterior part of the bulb, the course of extravasated blood or urine is governed by the attachments of the deep layer of the superficial fascia, or fascia of Colles.

Extravasation of urine occurring through laceration in the bulbous region of the urethra will first follow the space enclosed by this fascia in front and below, and by the anterior layer of the triangular ligament posteriorly, and, as it cannot reach the ischio-rectal space on account of the attachment of the fascia to the base of the ligament, and cannot reach the thighs on account of the insertion of the fascia into the ischio-pubic line, it is directed into the scrotal tissues, and thence up between the pubic spine and symphysis until it reaches the abdomen.

If the injury affect the membranous urethra alone, the surrounding structures not being involved in the laceration, the extravasated urine would be confined to the region included between the layers of the triangular ligament, and would only gain access to other parts after suppuration and sloughing had given it an outlet. The consecutive symptoms would then depend upon the portion of the aponeurotic wall which first gave way.

If the injury is situated behind the posterior layer of the triangular ligament, *i. e.*, in the prostatic urethra, the urine may either follow the course of the rectum, making its appearance in the anal perineum, or, as it is only separated from the pelvis by the thin pelvic fascia, it may make its way through the latter near the pubo-prostatic ligament, where it is especially weak, and may spread rapidly through the subperitoneal connective tissue.

According to Iversen, the external swelling is usually absent, and the above occurrences are to be suspected from the severity of the symptoms.

In the presence of retention of urine from recent rupture of the urethra in which catheterism is impossible, there can be no doubt as to the proper procedure. Immediate perineal section is so obviously the only operation which meets all the indications that no other can be seriously considered.

In mild cases of rupture, *i. e.*, in those where after such an injury there is an appearance of blood at the meatus, with difficult urination, or with retention, but with no evidence of extravasation, or no general alarming symptoms, and in which catheterization is easy, the surgeon may be content with regular evacuation of the bladder by means of a soft instrument, well greased with carbolized oil, and with prescribing absolute rest, the patient being carefully watched for the onset of fever or the appearance of local swelling. In cases of a more severe type, in which, in addition to urethrorrhagia and retention of urine, there are evidences of extravasation, and in which catheterism, though difficult, is possible, it is wisest to leave a full-sized catheter in the bladder, and at the same time freely to lay open the perineum and scrotal tissues, or any which have been involved in the extravasation.

In the cases of greater gravity, however, where no instrument can be passed into the bladder, perineal section is, as I have said, imperatively indicated. The steps of the procedure are obvious and beyond dispute except as to a few points; which I may mention *seriatim:*

1. If persevering search fails to reveal the proximal end of the torn urethra, are suprapubic cystotomy and retrograde catheterization justifiable? I am inclined to answer this affirmatively, though such failure should be most exceptional. If the bladder contains urine, and particularly if it is distended, pressure at the hypogastrium or bimanual pressure with the fingers of one hand on the abdomen and of the other in the rectum as recommended by Dr. Bangs will often cause a jet of urine to issue from the proximal end, and will at once disclose its situation. Hæmostasis in the whole wound by very hot water will sometimes reveal the urethra by emphasizing the difference between its color and that of the surrounding parts, the urethra generally showing much paler. The relation to the pubis and to the lower edge of the triangular ligament should be most carefully borne in mind, the search for the torn end in ruptures and for the portion behind the stricture in these cases being frequently carried too near the pubes. The membranous urethra in the adult usually runs through the ligament about one inch below the symphysis and about three-quarters of an inch above the perineal centre. All guides, however, fail occasionally in certain of these cases, and it is then that supra-pubic cystotomy is warranted as an operation with so small a mortality that the slight additional risk is far outweighed by the advantage to the patient of having even an imperfect restoration of his urethral canal.

Retrograde catheterization was practised for the first time in 1757, by Verguin, a surgeon of Toulouse, who passed a catheter into the urethra through a pre-existent fistula of the bladder consecutive to supra-pubic puncture. Since which time a number of surgeons have had recourse to this procedure, and Sédillot formerly expressed the opinion, "that in the absence of a pre-existent fistula, if, in the course of an external urethrotomy, undertaken for an impassable stricture, it were found impossible to discover the posterior end, the surgeon would be justified in doing a supra-pubic cystotomy at once, in order to practise retrograde catheterization.[1]

2. Although some differences of opinion exist as to the value of a retained catheter after most perineal operations opening the urinary tract, there can be no question of its value in cases of rupture, and I believe that it is of great use in *all* forms of perineal operation opening any portion of the urinary tract. If Spence's caution is observed, and it is not allowed to project too far into the bladder, if it is kept clean and sweet by regular antiseptic injections, it is of the utmost advantage in aiding in the

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[1] Duplay: "Injuries and Diseases of the Urethra," International Encyclopædia of Surgery.

prevention of urethral fever, as has been shown by Keyes, Harrison, Diday, Shield, Hill, and many others.

3. After the introduction of the catheter in cases of rupture, is there definite advantage to be derived from urethral sutures?

The surgeon has four plans open to him: *a*, To leave the wound open without any attempt at coaptation; *b*, to suture the urethra only; *c*, to suture only the perineum; *d*, to suture the urethra at one place and the perineum at another.

The experiences of Guyon, Championnière, Le Dentu, Molière (de Lyon), Erasme, Kaufmann, of Zurich, Tenier, C. H. Mastin, Marmaduke Shield, and myself would seem to justify the employment of sutures of the urethra. By the introduction and retention of a large catheter, and the careful coaptation of the torn ends, we meet all the indications, which are:

1st. To open a large passage for the accumulating fluids; 2d, to keep up a free flow of urine; 3d, to encourage rapid union of the two ends of the urethra and the walls of the cavity formed by the extravasation into the perineum; 4th, to prevent the formation of a cicatricial stricture of the urethra.

My results by these methods have thus far been so extremely satisfactory that I shall certainly continue their employment.

4. The sterilization of the urine by boric acid, as recommended by Palmer and others, or by salol following the method of Dreyfous and Lane, is of great importance in the after-treatment of all these cases, and should never be omitted. These remedies will be more effective in my judgment if combined with full doses of quinine.

In all cases in which perineal section is performed for impassable stricture, without other complications, the method of Mr. Wheelhouse, of Leeds, seems to me to meet every indication. The passage of the staff to the stricture shows the exact site of the latter; the insertion of the threads into the divided urethra, serves not only to hold it open and give an opportunity for the discovery of the proximal portion, but also seems to fix the anterior end, and render it easily recognizable during the operation. The least useful direction which Mr. Wheelhouse gives is that of turning the staff with the concavity of the curve upward, so as to hook it into the upper portion of the urethral wound. The instrument is sometimes in the way, has to be held by an assistant, and it seems to me does not afford much help during the operation.

COMPLETE SCLEROSIS OF GOLL'S COLUMNS AND CHRONIC SPINAL LEPTOMENINGITIS, WITH DEGENERATIVE CHANGES IN THE FIBRES OF THE ANTERIOR AND POSTERIOR ROOTS.

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The function of Goll's column, or, anatomically speaking, the posterior median column of the spinal cord, has long been a subject of inquiry by physiologists and pathologists. Schiff divided the posterior median column in animals, and the inference which he drew from his experiments was that the fibres of this portion of the cord conduct tactile sensations. The difficulties of dividing this column without injury of fibres belonging to other systems, are insuperable. With the exception of the experiments of Rossolymo upon guinea-pigs, experiments upon animals such as monkeys, dogs, and cats all tend to confirm the inference derived from pathological observations made upon cases of injury of the posterior roots, such as lesions of the cauda equina. There can, therefore, be no doubt that the fibres of Goll's column are formed from processes of the cells of the spinal ganglia which pass in by the posterior roots, run through the postero-external columns, and eventually enter the median column of the same side. It is probable that these fibres become smaller as they ascend, for if we take a definite area of Goll's column, the fibres of which were derived from the lumbar and sacral roots,[1] say in the upper dorsal region, and count the number of fibres in this area by projection of a photo-micrograph upon the screen, it will be found that a greater number of fibres will exist in the upper cervical region than in the dorsal. This, of course, will account for the area of degeneration becoming smaller, the higher the level of the section. The fibres of Goll's column end above in the post-pyramidal nucleus.

The cells of this nucleus send fibres to the cerebellum, consequently impulses travelling up the fibres of Goll's column eventually reach the cerebellum. *A priori*, we should expect that Goll's column does not transmit sensory impulses unless they be those relating to the muscular sense. Cases which have been published, and which I shall refer to later on in detail, together with the present case which I here record, in which there was a sclerosis causing total destruction of almost the whole of the fibres of Goll's column, show that this column certainly does not conduct any centripetal impulses connected with the sense of touch, heat and cold, or pain. In these cases there have been symptoms which would point to a loss of the muscular sense, but the question arises whether these symptoms could not have been explained by the affection of the roots within the spinal canal, or the peripheral nerves. That the impulses should eventually reach the middle lobe of the cerebellum tends to show that this column may be connected with the muscular sense ; moreover, the fact that in locomotor ataxy it is generally the seat of extensive degenerative changes in company with the postero-external column, also lends support to this view.[1]

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[1] This can be ascertained by comparison with limited areas of degeneration made experimentally.

Dr. Tooth considers that the posterior median column (consisting as it does of small fibres) conveys impulses from the viscera. I think cases of sclerosis of Goll's column do not support this view, although, anatomically speaking, it seems a plausible hypothesis; but, as I have before suggested, the fine nature of the fibres may be due to their long course. I have endeavored to show the importance of this subject from a physiological point of view by these introductory remarks. I will now pass on to a description of the case.

M. G., aged forty-six years, fly-master, was admitted into Charing Cross Hospital under the care of the late Dr. Pollock, March 25, 1884, and I am indebted to Dr. Murray for having given me the spinal cord and notes of this case.

There was nothing in the family history of the patient which would have any bearing upon the case, and no hereditary predisposition to disease was indicated. There was no history pointing to syphilis, rheumatism, or tuberculosis, and for more than thirty years he had been free from illness. His occupation, however, exposed him to cold and wet daily, and he has frequently been wet through. Moreover, previous to his illness he had drank heavily, taking as much as four pints of beer and several "goes" of spirits daily.

Present illness commenced early in 1882, with failure of power in the legs, the attack coming on while the patient was at his work in the morning. Two hours after the onset he was unable to walk. He suffered a great deal of pain, the legs becoming flexed and rigid. The loss of power gradually increased. About May, 1882, he noticed that the legs were wasting, and after September he was unable to walk even with support. A month or six weeks after the commencement of his illness, he noticed twitching of the hands, accompanied with weakness ; and the arms began to waste, but he did not completely lose the use of them. His condition gradually became worse, and he was an inmate of several hospitals before admission to Charing Cross.

Present state: Patient is fairly well nourished. Temperature 99° to 100°. Skin cool and moist ; no rash, œdema, or redness ; complains of no pain.

Upper extremities, including muscular attachment to scapula and clavicle, are thin and uniformly wasted. There is no rigidity except in the phalangeal joints, which can hardly be moved at all, voluntarily or passively. Other movements are weaker than normal, but no movements except those of the second and phalangeal joints absolutely lost. The weakness and wasting are more marked on the left than on the right side, and, perhaps, the thumb and first dorsal interosseous are more affected than other muscles. The grasp is performed by means of flexion of the metacarpal phalanges upon the metacarpal bones. He can just hold a spoon or knife with his right hand. With his left hand he cannot hold either. Frequent fibrillary movements seen. Sensations of tactile and painful impressions normal, also of heat and cold. Absence of elbow- and wrist-jerks.

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[1] Secondary Degeneration of the Spinal Cord, p. 71.

Lower extremities: Hips and knee-joints are kept perpetually in a position of semi-flexion, the ankles extended. Patient can flex hips and knee-joints fully, but cannot straighten them beyond an angle of one hundred degrees. There is slight power of movement of the ankle-joints and left great-toe joint, all other movements of the joints in the feet absent. Wasting of the lower extremities, especially below the knees, more marked even than in the upper extremities. It seems to be uniform, and not to affect any particular group of muscles. The tendo-Achillis on both sides is rigid. No ankle-clonus, and on the left side no trace of knee-jerk obtained, but on the right a slight flicker can be observed. Tickling the soles is painful, and causes movement of knee- and hip-joints, especially of the latter.

Abdominal and epigastric reflexes absent on both sides, cremasteric obtained. No difficulty in micturition or defecation. Complete loss of sexual power and desire for the last two years. Patient has never noticed any difference in hearing, smelling, or tasting.

Vision: Movements of eyeballs and field of vision normal. Contraction of pupils to light and accommodation natural. No nystagmus.

Facial movements, movements of tongue, speaking, mastication, and swallowing performed naturally.

All muscles react to faradic current, but a considerably stronger current than normal required to produce contraction. Irritability to galvanism is distinctly diminished.[1] K. C. C. greater than A. C. C.

Chest is of fair shape, no cough or expectoration. Movements not good, unsymmetrical. There was evidence of consolidation over the right apex, there being weak but harsh breathing, defective resonance, and bronchophony.

Heart-sounds weak, no valvular disease, cardiac dulness not made out.

Digestive system: Tongue clean, no sickness. Bowels regular.

Spleen: Physical signs normal.

Liver: Somewhat enlarged.

Urine: No albumin, acid, sp. gr. 1020.

A weak faradic current was ordered to be applied every morning for about ten minutes, and a tonic was prescribed.

April 4. Chest symptoms became much worse, evidences of excavation of the right apex. Temperature 101°, considerable capillary bronchitis, weak action of the heart. Chest was ordered to be rubbed night and morning with lin. teberinth. acet. Sp. ætheris and mist. cinch. co. prescribed. The lung disease progressed rapidly, and on April 14th the temperature rose to 104°. April 15th the patient died.

Autopsy showed general tuberculosis, with formation of cavities in both lungs, congestion and œdema of the mucous membrane of the bronchial tubes, and a thickened pleura adherent in many places. There was an old cicatrix at the apex of the left lung, showing that the disease had been of considerable standing.

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[1] At this time a galvanometer was not in use at the hospital.

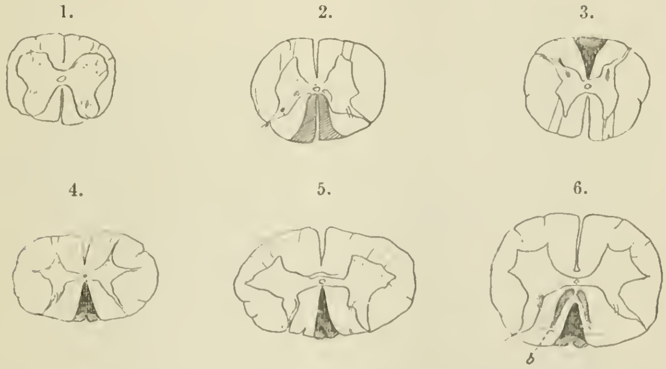
Heart: Valves healthy, degeneration of the muscular tissue.
Liver: Enlarged and fatty.
Kidneys: Normal, also spleen.

No note is made of the naked-eye appearance of the spinal cord, but when handed to me the dura mater appeared of normal thickness, and to the naked eye beyond the obvious sclerosis of Goll's column there was nothing very evident. I may state that I did not see the case, but after examination of the spinal cord I found it to be of unusual interest, and asked Dr. Murray to let me have the notes, which he was kind enough to give me.

The microscopical examination of the spinal cord, the roots, and ganglia, was made with the following results:

The naked-eye appearance of sclerosis of Goll's column did not become evident till the first lumbar segment, in this respect corresponding to other cases published. The appearances of the degeneration are shown in Fig. 1.

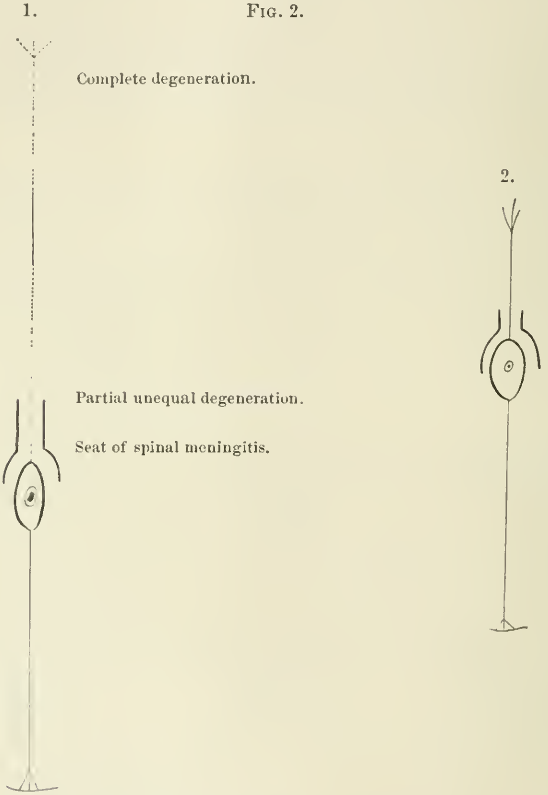
Fig. 1.



Sclerosis of Goll's column. 1. Lower lumbar, free from degeneration. 2. Scattered degeneration in posterior columns, indicated by light shading. Twelfth dorsal. 3. Dark shading, absolute degeneration of the greater part of Goll's column at level of eighth dorsal. 4. Second dorsal. 5. Eighth cervical. 6. Fourth cervical. Light shading partly degenerated fibres.

Careful microscopical examinations of the sections at different levels showed a chronic leptomeningitis, causing very considerable thickening of the pia mater with encroachment of the inflamed tissue upon the periphery of the cord. In this chronically-inflamed membrane were observed nerve-roots, the fibres of which were in various stages of degeneration, as shown in the accompanying Fig. 2. The number of degenerative fibres found in different bundles varied considerably. Many bundles showed absolutely no degenerative changes. The anterior cornual cells, even where there was considerable degeneration of the anterior roots, showed no marked changes, consequently, the fibres were damaged after they had left the cord. Examination of the spinal ganglia showed no obvious changes in the cells or fibres in connection therewith. Inasmuch as Goll's column was sclerosed throughout, it must be conceded that the fibres are damaged between the ganglia and the cord, the fibres of Goll's column suffering much more on account of their long course (just as in primary lateral sclerosis the cross-pyramidal tracts are affected probably on this account). The vessels in the thickened membrane, and particularly in the sclerosed portion of the cord, presented a remarkable appearance, viz.: an enormous thickening of the walls of the small arteries and arterioles (Fig. 3), and it is possible to

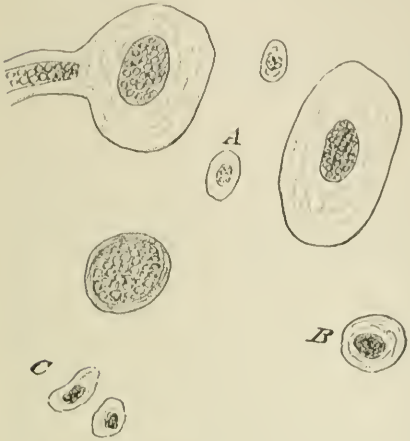
FIG. 2.



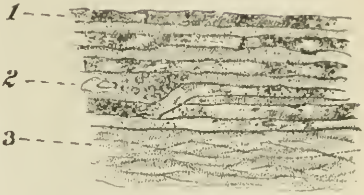
Nerve-fibres in different stages of degeneration. 1. Long fibres of Goll's column. 2. Short fibres of Burdach's column.

connect the complete destruction of the long fibres of Goll's column, with an arrest of nutrition due to this disease of the small vessels. It

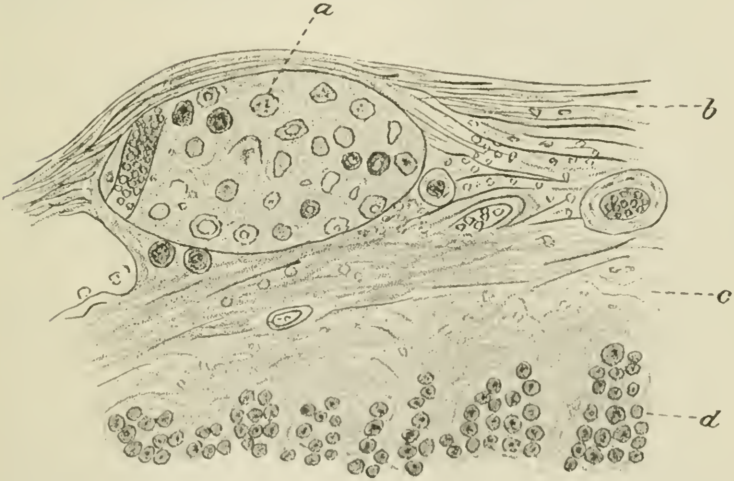
Fig. 3.



Cross-section of arteries and nerve-roots. A, B, C. Arteries of Goll's column, cervical region.



1, 2, 3. A portion of a small bundle of the posterior root, showing nerve-fibres with ganglion sheath broken up in various shapes of chronic degeneration. × 250 diameters.



First sacral, anterior root cut transversely. × 250 diameters. (Gardiner.)

seems to be of the nature of an arterio-capillary fibrosis, or rather a chronic periarteritis. The other columns of the cord showed no degenerative changes, and the fine nerve[1] plexus around the cells in Clarke's column, which is the first seat of degenerative changes in locomotor ataxy, showed no atrophic change, proving conclusively that the short fibres of the postero-external column had not suffered. But there was a scattered degeneration in the lower dorsal region in Burdach's column. This was due to fibres belonging to Goll's column passing through in a median direction. The wing-like area of degeneration seen in the upper part of the cervical enlargement, Fig. 1, *b*, is due to the fibres of the brachial roots coming in.

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[1] Krauss: "Im Pathologischen Anatomie der Tabes Dorsalis." Neurologisches Centralblatt, February, 1885.

Abstracts of cases of degeneration of Goll's columns.

(The sections were cut in celloidin and stained by the Weigert method.)

(I.) Degeneration der Gollschen Stränge bei einem Potator. (Vierordt, Leipzig, *Archiv. f. Psych.*, 1886.) A laborer, aged thirty, a heavy drinker, non-syphilitic, suffered with frequent stabbing, lightning pains in the lower extremities, likewise with weakness and uncertainty of the latter. No ataxy; normal muscular sense, normal sensibility of the skin. No tenderness on pressure of the nerves, but great pain on pressure of the muscles. Diffuse wasting of the muscles of the lower extremities, diminution of strength, but in proportion to the volume. Some ataxy of movements. Slight paræsthesia on the outer side of the calf. No hyperæsthesia, normal muscular sensation. Ataxic gait, inability to stand with the eyes closed. Loss of knee-jerks, skin reflexes remain. Normal reaction of muscles. Pupils, bladder, and rectum normal. For some time improvement, then a new symptom—creeping sensation in the legs. Later on, the upper extremities began to waste.

Autopsy: Sclerosis of Goll's column—chronic leptomeningitis—disease of some of the roots, but the greater number were not degenerated. The sciatic nerve was examined and found to be normal. Vessel-walls of the membranes of the spinal cord greatly thickened.

The author considers the case to be one of primary descending degeneration of Goll's column.

(II.) (*Friedreich. Über progressive Muskelatrophie*, Berlin, 1873.) A case of degeneration of Goll's column, and especially of the anterior and posterior roots, with enormous degenerative atrophy of the muscles. It occurred in a woman, aged thirty-five, who suffered with violent burning pains; atrophy of the legs first, then of the hands and forearm, then of the upper arm; sensibility remained normal. Sphincters natural.

(III.) (*Pierret. Archiv de Physiologie*, 1875, p. 74.) This author describes the spinal cord of an old woman who, during the last eleven years of life had suffered with formication in the arms and legs, with very slight diminution of sensibility. In this case there was a sclerosis limited to Goll's column.

The points of interest in these cases are:

1. That Goll's column may be connected with the conduction of impressions relating to the muscular sense, or that the fibres of these columns have some other function not yet determined. The singular absence of visceral complications in these cases does not lend support to Dr. Tooth's view that Goll's column conducts visceral sensations.

2. The resemblance clinically between the case here recorded and that recorded by Vierordt—viz., briefly summarized in both cases, a history of alcoholism, pains in the lower extremities followed by wasting, no loss of sensation (excepting a muscular sense); after a time the upper extremities affected in a similar manner to the lower, death from tuber-

culosis. The pathological condition met with in the cord was also very similar, both as regards the area of degeneration and the partial affection of the roots. The complete destruction of Goll's column, excepting a few fibres posteriorly in the cervical region and medulla, and the absence of degeneration elsewhere in the cord, both in the other tracts and the cells and fibres of the gray matter, were present in both.

3. The absence of knee-jerks (and even the inability to stand with the eyes shut, noticed by Vierordt in his case) could be accounted for by the degeneration of the terminations of the motor nerves, which would also explain the wasting of the muscles. The degeneration of the motor nerve-endings might be explained by the alcoholism or by the leptomeningitis, causing nutritive disturbances of the anterior roots. In my case, and also in Vierordt's to a less degree, some of the anterior roots showed degenerative changes. The centre of nutrition, even of the end-plate of a motor nerve, is the ganglion-cell. Although the leptomeningitis may not have been severe enough to interfere with the nutrition of the whole nerve-fibre, yet it was sufficient to produce a degeneration of the terminals, especially of the long fibres of the legs and arms, which are proportionally much more remote from their seat of nutrition than the nerves to the trunk-muscles.

With regard to Goll's column, the same inference may be drawn. The complete destruction of this column in the cervical region, whereas hardly any trace of degeneration can be seen in the lower lumbar and sacral regions, may be explained thus. The seat of nutrition of the fibres of Goll's column is the spinal ganglion. We have seen that the ganglia and the roots are involved in an inflammatory process, with great thickening of the vessel-walls. The portions of these fibres most remote from the seat of nutrition will suffer; consequently the fibres which come from the leg will be degenerated most high up in the spinal cord. We can only explain in this way the complete escape of the short fibres which make up the postero-external column, and which soon come to their station in Clarke's column, hence are not atrophied (*vide* diagram). Vierordt considers that Goll's column in his case degenerated downward, and I think the above explanation would coincide with this view.

Moreover, we have in the (so-called) idiopathic lateral sclerosis a confirmation of what I have regarded as the explanation of sclerosis of Goll's column. In this disease the long fibre systems of the cross-pyramidal tracts are alone degenerated, and the process invariably commences in the legs, because the fibres going to the anterior horns of the lumbar and sacral regions have a much longer course, and are more remote from their centre of nutrition, hence more readily undergo degenerative changes when their nutrition is interfered with, for even the terminals of the fibres are dependent for their nutrition upon connection with the ganglion cells from which they originally grew.

Another explanation of the degeneration of Goll's column to the exclusion of all others has been suggested—that is, an encroachment of the fibrous tissue, which certainly is more marked in the posterior median column of the cervical region of the normal spinal cord.

ANTISEPSIS AND ASEPSIS BEFORE AND AFTER MAJOR GYNECOLOGICAL OPERATIONS.

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While operative surgery is ever a more brilliant subject for a discourse, there are some plain matters which lie at the bottom of all successful work about which surgeons are not yet practically united, and my observation for some years past has taught me that the rising gynecologists need above all else minute painstaking instructions in these fundamental principles—the practical significance of "sepsis," "antisepsis," and "asepsis." The greatest gynecological want is that men should be taught to apply in the simplest way the recent teachings of bacteriology.

The touchstone revealing the character of a man's work is the view he holds of this important question.

"Cleanliness" (microscopic), the methods of securing it, and the methods of maintaining it, are the very bone and marrow of all good surgical work to-day.

"Sepsis"[1] is a morbid condition of the body, due to the action of specific germs, which are the septic agents.

"Antisepsis" is any efficient means put in action by which these germs are rendered inactive, destroyed, or removed from the body.

"Asepsis" is the condition of the body, or a part of the body, free from septic germs.

Cleanliness in this sense is asepsis, and is microscopic, not macroscopic.

These definitions at once do honor to the great army of workers who, within the past twenty years, have shown us why suppuration and sloughing (septic processes) were wont to prevent the rapid healing of fresh wounds. They at the same time place a wide gulf between those who thus accept the conclusions of our contemporaries working in the bacteriological field, endeavoring to ground all their surgical work upon the principles by them laid down, and those on the other side who, with a remarkable pertinacity, still insist that nothing new has been discovered, and that scientific surgery has received no riches from the bacteriological laboratory; even resorting to an unworthy *double-entendre* on the word "*cleanliness*," trying to confuse the new "microscopic" with the old "macroscopic" cleanliness, to prove that "since the fathers fell asleep all things continue as they were."

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[1] "Sepsis" is used in this connection as a convenient general term to designate traumatic infections.

This microscopic cleanliness is the keynote of all successful gynecological surgery, and must pervade the work from beginning to end.

The great growth in the success of gynecological operations within the past few years has been due to the simplification and perfection of the means taken to secure this important end, with the abandonment of the complicated unnecessary machinery at first hastily thrown up to protect our patients, as soon as we learned that the enemies to our success were the hardy, minute, all-pervading microörganisms.

I shall in this paper dwell at some length upon this and some other important principles, controlling all of our gynecological work, illustrating the application of the former by means of major cases, with a clear understanding that the same laws apply to the lesser or minor gynecological cases—here, as elsewhere, the major thus including the minor.

The applications of these principles to a given operation must be considered at three different periods:

First. The condition of and the preparation of the patient for the operation, and the preparation of operator, assistants, instruments, and dressings.

Second. The personal cleanliness of the operator and his assistants during the operation; and

Third. The care of the patient and the wound after the operation.

THE SELECTION OF THE PATIENT.

It is important that a gynecological operator should first learn to select his cases with care, making sure that no grave organic disease complicates the local trouble, that there is no other coexisting ill from which the patient must soon die, even if she be cured of a tumor or other pelvic ailment.

An oversight of this kind is often attended by the most serious immediate consequences, and lives are thus frequently shortened, which could have been preserved for months or years by a little more insight and careful preliminary analysis. Surely nothing can exceed the chagrin of a specialist who has had the narrowness of his horizon demonstrated by any such accident.

I venture, therefore, to name in a brief review some of the chief stumbling-blocks which I have thus repeatedly found in my way.

To avoid this error a careful history of every case must be taken, including notes upon family tendencies to particular diseases, such as cancer, Bright's disease, phthisis. An examination should always be made into the patient's mental condition, with inquiry about insanity in the family, or previous attacks in the patient. It is well known that a fresh attack of mania may be precipitated by an operation, and a great many patients in gynecological hospitals are paranoiacs. Next look into the condition of the heart and lungs. I have seen a patient with a large dilated heart die from the simple tapping of an ascites. With a hydrothorax it would be dangerous even to give an anæsthetic.

If the heart has a valvular lesion I prefer chloroform anæsthesia, which I have thus employed repeatedly.

Phthisis, however, even when far advanced, does not necessarily contra-indicate operation. Some nine years ago I operated on the relaxed vaginal outlet of a woman so far reduced by this disease that she could scarcely drag herself from room to room. She at once improved remarkably, and for years seemed comparatively well, and is, for aught I know to the contrary, living to-day.

I would even recommend the removal of tuberculous tubes and ovaries, and draining a tuberculous peritonitis in a phthisical patient, where the abdominal disease has advanced so far as to be distressing to the patient. The improvement in such cases is sometimes very great and prolonged.

Below the diaphragm lie a number of dangerous traps for the unwary gynecologist.

Abscess of the liver may prove a complication. I recently lost a case where there was gangrene of the right ovary and tube, with gangrene of the vermiform appendix, which had sloughed off at its attachment to the colon. The patient recovered from the operation, got up, and went about, but died on the twenty-sixth day from a large concealed metastatic abscess in the liver, arising from the gangrenous appendix, transmitted through the portal system. The abscess ruptured into the bronchial tube, and drowned her at once.

Cancer of the ovary is not unfrequently complicated by a cancer of the pylorus, which makes pelvic operation futile. Two such cases have occurred in my experience. In the first, I operated removing the large brain-like ovary. The patient recovered, and went home, and died some months later of her pyloric disease.

In the second case I refused to do more than tap the abdomen, removing a large ascitic accumulation. The autopsy confirmed the diagnosis, revealing as well disseminated cancerous plates on the peritoneum.

A peri-appendicitis with adhesions is frequently found associated with tubo-ovarian inflammatory diseases, and in no way contra-indicates operation. In one of my cases of pyosalpinx there was, as well, an independent abscess of the vermiform appendix.

Of all the organs in the body whose functional activity is vitally important to the convalescent, after a serious gynecological operation, the kidneys may be said to be paramount, and the writer would feel himself criminally negligent if he failed in any instance to determine the exact condition of the renal secretion before opening the abdomen.

Careful statistics will show that with the expulsion of sepsis from the mortality record after gynecological operations, uræmia has stepped very high in the list of fatalities.

Without entering into the causes, we have but to recall the familiar facts that the prolonged presence of pus in the body is productive of serious changes in the kidneys, heart, and liver; and again that the gonorrhœa which produces the pyosalpinx, may produce at the same time, by travelling up the bladder and ureter, a pyelo-nephrosis; and more important still, because most frequent, we must recall the fact that any mechanical obstruction to the flow of urine tends to produce nephritis.

My work has abundantly proven these observations, showing that the presence of pelvic tumors is frequently a cause of albuminuria.

In the ninth paper of my recent work, I issued a preliminary report on the urinary examination of ninety-five gynecological cases.[1] Out of these were fifty cases of abdominal section taken successively, showing the presence of some albumin in fifteen instances, or thirty per cent.

In eight of the fifteen, hyaline and granular casts appeared. Thus sixteen per cent. had both albumin and casts in their urine. The significance of this discovery may be appreciated by citing such an extreme case as that in the third article of the report (*v. supra*), where a colored woman died (without operation) of the renal changes induced by a large myoma uteri. The anatomical diagnosis reads: "Myoma of uterus, with central necrosis; dilatation of ureters from pressure; pyelo-nephrosis; chronic passive congestion and emphysema of lungs; displacement of viscera and deformity of thorax, in consequence of tumor. General marasmus. Heart hypertrophy, with hyaline calcific and fatty degeneration."

I do not as yet wish to lay too much stress on these figures, which are astonishingly large, but insist that if only one or two per cent. are found to be thus affected, the investigation is a vitally important one!

Albuminuria and milder grades of Bright's disease are not contra-indications: I do not hesitate to operate where I find albuminuria and even casts; but when it is necessary to operate on such cases, it is better to be forewarned as to the dangers, so that by using chloroform, and shortening the time of the anæsthesia, and by supplying external heat, the shock to the system may be as slight as possible; also by the use of the drainage-tube we may avoid to the utmost any taxation of the emunctories. We must also avoid opiates, and by free purgation save and supplement the crippled renal emunctory to the utmost. Advanced Bright's disease is an absolute contra-indication against any elective gynecological operation requiring anæsthesia.

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[1] The Johns Hopkins Hospital Reports, vol. ii., Nos. 3, 4, Paper ix.

In three cases out of fifty, two pus cases and one large ovarian tumor, in which albumin with hyaline and granular casts was found before operation, the urine exhibited nothing abnormal upon their discharge from the hospital, showing that the tumors had acted as causes in producing the renal disturbance.

Preparation of the Patient for the Operation.

The guiding rule in fixing the date for operation is to take as much time as is necessary to get the patient in the best possible condition her disease will admit of. In a suppurative peritonitis, and ruptured extra-uterine pregnancy, there is, as a rule, no time for previous preparation beyond the administration of a purgative and enema and some stimulants, while the surgeon is getting to the patient; but in almost all other cases we shall do better to make haste slowly.

With rest in bed for one or two weeks or longer, and with careful feeding five or six times a day, a wretched, pinched, and worn-out body will usually recover some of its pristine vigor, and be thus better able to stand the shock of an operation.

It is of paramount importance in this connection to recognize the fact that ovarian and tubal abscesses are naturally characterized by repeated attacks of pelvic peritonitis, confining the patient to bed for one or more weeks with a swelled abdomen, quickened pulse, elevated temperature, and severe abdominal pains. But after one of these attacks is over, the patient usually improves until she feels quite well again.

It is better not to operate during such an attack, but to wait for the interval of comparative health and strength, when the operation will be better borne. One must, however, carefully distinguish the profounder shock with collapse, due to an abscess ruptured into the free peritoneal cavity, a condition admitting of no delay.

Where the operator selects his own time for an operation, he should at once begin not only to tone up the patient's general health by rest and feeding, but to quicken the action of the skin and the bowels by baths and free evacuations, and to prepare the abdomen and genitals by daily washing, and two or three days beforehand by careful scrubbing, along with daily vaginal douches, one pint of a solution of bichloride of mercury (1 : 5000) or carbolic acid (3 per cent.).

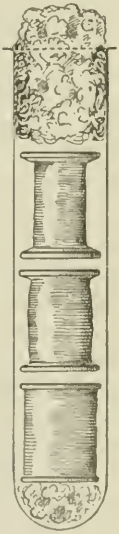
A thin poultice of sapo viridis, one foot square, laid on the abdomen two hours beforehand, softens the superficial layer of epithelium for the last washing, which it receives on the operating-table. A half-hour before the operation the patient receives forty grains of the subnitrate of bismuth, and, if there is no contra-indication, a quarter of a grain of morphia. The latter makes the patient more susceptible to, and less anxious about, the anæsthetic, and the bismuth acts by contracting the intestines and thus allowing more room to work in the abdominal cavity.

Instruments, Ligatures, Dressings.

Five years ago I used for the disinfection of my instruments a double-walled copper oven, raised to the temperature of 140° C. (315° F.), for an hour. It was then demonstrated by bacteriologists that moist heat at 212° F. (100° C.) was even more effective.

It is now more than a year since I brought from Europe a newly-devised Rohrbeck oven for disinfection by steam. It is possible in this apparatus, after due exposure to the steam, by turning a ventilator and shutting off the heat, to convert it at once into a drying oven, thus automatically drying the instruments and dressings.

Fig. 1.



My final step in this direction was taken some months ago when I adopted a simple copper steam-sterilizer (Arnold's), made in America, for the disinfection of instruments and all dressings. Dr. Abbot's tests have shown this to be thoroughly reliable, giving a uniform heat of 212° F. in all parts of the cylinder, and its simplicity commends it for all practical purposes.

After an operation of a septic nature, the instruments are first washed, and then sterilized for a half-hour in this boiler, when they are taken out and dried at once. Again before the next operation they are laid in the sterilizer for a half-hour, when they are removed and placed in the trays and immersed in water, ready for use. As soon as the instruments are removed, the dressings—absorbent cotton and bandage—are put in, and left there until required at the close of the operation.

So satisfactory, so thorough, and so reliable is this steam disinfection, that I have also entirely given up boiling the silk ligatures, as well as the use of any antiseptic solutions, as heretofore, in their preparation, adopting instead a plan invented by Dr. Halsted. The silk is cut in required lengths and wound on glass spools, these are then put in a long test-tube of large calibre, plugged with cotton, in the same manner as the gelatine culture-tubes. (Fig. 1.) The tube thus loaded is placed in the steam cylinder for a half-hour without removing the cotton; it is then taken out, and put back again for a half-hour on the following day, when the sterilization is absolutely certain.

The cotton plug must not at any time be removed from the tube until the ligatures are needed for use. Silk prepared in this way retains all its strength and remains sterile indefinitely until the tube is uncorked.

With the steam thus in constant use, towels and gauze, and even long stockings drawn over the legs in perineal operations, are also readily sterilized without the use of any antiseptic solutions.

The Operator and the Assistants.

The operator and his assistants should spend not less than ten minutes in scrubbing their hands with soap and warm water, devoting particular attention to the nails. That this alone is not sufficient to remove all the pus germs from the fingers, I have demonstrated in a series of experiments in which Dr. Ghriskey, the gynecological assistant, has each time succeeded in getting staphylococcus cultures after the most thorough, careful scrubbing on my part. Moreover, the cultures thus made were always taken from the nail of the index finger of my left hand, to which I had devoted the most painstaking attention in the cleansing. I follow this washing with water by an immersion of the hands for a half minute in a saturated solution of potas. permang., this is next removed by a saturated solution of oxalic acid in water, and finally the hands are immersed in a bichloride of mercury solution (1 : 1000) for one minute.

I am at present conducting a series of experiments to determine whether the danger of infection is as great after the bichloride as after the soap and water, when I shall be able to decide on scientific grounds as to the further use or the discontinuance of the drug.

When the patient is placed on the table for operation, her abdomen is first washed with soap and water followed by ether, and finally the bichloride in water (1 : 1000). The field of operation thus prepared is secluded by aseptic sterilized towels, placed across the chest and over the thighs and on either side; a piece of gauze, large enough to reach from the chest to the knees, covers the whole abdomen. A slit is cut in the centre of this, and when its edges are pulled apart the abdomen is bared from umbilicus to pubes. Through this opening, thus protected on all sides, the operation is performed.

The central idea which must dominate operator and assistants throughout the operation is, that having thus come to the work under conditions absolutely aseptic, they must be kept so throughout. There must be no break in the phalanx, such as occurs when operator or assistant shakes hands with visitors or touches unprepared parts of the patient, or an assistant dips water out of the reservoir with a cup or pitcher which has been standing on a table or shelf not included in the field prepared for the operation, etc., *ad infinitum*, including hosts of slips in the technique, only avoided after long experience, which finally develops a keenness of perception for inconsistencies in the technique which may well be designated an "antiseptic conscience."

It is true that all these antiseptic precautions are frequently set at naught by the amount of sepsis encountered inside the patient as soon as the abdomen is opened.

Shall we for this reason relax our precautions and be careless about outside contamination even in these cases? By no means; the rule must be in all cases the utmost cleanliness attainable under the circumstances, even the worst. The principle must never be voluntarily sacrificed by the operator. In addition to this we cannot be sure of such hastily-drawn conclusions, for much of this ill-looking pus found in tubes and ovaries contains no germs which can be demonstrated, and is often, if at all, but mildly septic.

Asepsis after the Operation.

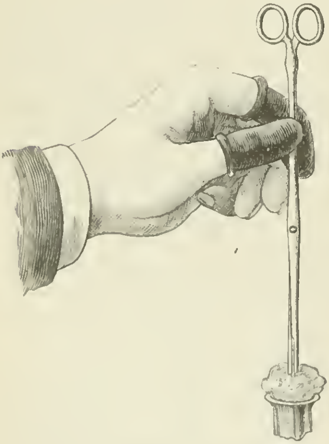
After a clean aseptic operation one great danger of septic invasion is from suppuration in the wound in the abdominal wall. Every effort should, therefore, be directed toward securing primary union. Septic material may work into the lips of the wound, or down the suture-tracks, the silk sutures acting like setons, the poison thus even penetrating the abdomen and causing death. A stitch-hole abscess in the abdominal wall is, unfortunately, a common sequence to an abdominal operation. This painful complication, which so seriously retards the recovery, can best be avoided by the following measures: the abdominal wound must be accurately approximated by the sterilized silk sutures, deep and superficial, three or four of each to the inch. The whole line of the incision thus closed is then coated with a mixture of iodoform and collodion (1:15) in a viscid state. This mixture is applied to every suture, with especial care to *saturate* every visible part of it with the viscid fluid, which dries at once. By this means the wound is concealed and the silk sutures are transformed from a bundle of threads with powers of capillary attraction, into a solid cord, like silkworm-gut or silver wire. The whole wound is at once dusted thickly over with iodoform and boric acid powder (1:7), which adheres tightly to the collodion. This makes an admirable occlusive dressing. A few layers of simple sterilized absorbent cotton are next applied, and finally over all a many-tailed bandage, held down by two tails between the thighs, pinned in front.

Whenever a drainage-tube is inserted, which translated practically means, whenever an open hole is left in the abdomen, the dangers of infection, after the operation, are greatly enhanced. The open tract down into the abdomen, with the presence there of free serum, as a culture medium, affords an excellent nidus for infection. The sepsis thus entering does not come from the air, nor apparently from the surrounding skin of the patient, but from the hands of the man who dresses the tube. A ready explanation of this exists in the fact that it is impossible, where a number of cases need dressing, to cleanse the hands each time with the same thoroughness considered necessary before an abdominal section; and yet the wound is the same, and the same absolute cleanliness is certainly called for.

My treatment of the tube is as follows: Just before applying the dressings and bandage, a small piece of sponge is grasped in the tube-forceps (specially constructed for the purpose) and the tube is cleaned with this until it is dry; a long, loose roll of gauze is then laid in the tube, which acts by capillary attraction, continuously sucking up and discharging fluids from the floor of the pelvis on to the dry absorbent dressings above.

In the subsequent dressings the tube is cleaned, first by lifting out the piece of gauze saturated with blood, then one of a number of little balls of sterilized cotton, about a third of an inch in diameter, kept in a glass-stoppered bottle, is picked up in the tube-forceps and carried to the bottom of the tube, at once soaking up any fluid lying there; this is then thrown away, and the process repeated until the tube is dry, when a gauze plug is again inserted until the next dressing. The great danger of contamination lies in handling the tube, and the gauze, and cotton dressings which enter it. To avoid this, I have arranged that while manipulating the drainage-tube and cotton balls, the thumb, index, and middle fingers of both hands are covered with rubber finger-stalls, taken out of a carbolic solution and washed and put back after using. By using these it is easy to prevent the naked skin from coming into contact with the tube or any substance entering it. As soon as a free discharge from the pelvis ceases (generally from the second to the third day after operation), the tube is pulled entirely out, and the hole obliterated by drawing up the loose suture lying in its track and left untied for this purpose.

FIG. 2.



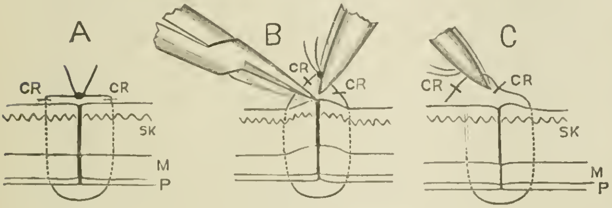
Hand grasping tube-forceps.

The catheterization of the patient is not a minor matter, but one of the most important procedures, for by means of the catheter, through carelessness, a violent cystitis can be excited. To catheterize, the nurse must expose the parts, cleanse the genitals, very carefully wiping the orifice of the urethra with a little absorbent cotton, and only then catheterize when it is impossible that any foreign matter can be carried up into the bladder on the point of the catheter from the outside.

The sutures closing the abdominal incision should all be removed in from seven to eight days. Care must be taken in their removal not to convert this simple step into a source of irritation or infection of the wound.

There is usually a little cake of incrusted lymph and powder where the suture emerges from the skin; and in removing the suture its loop must not be cut above, but below this point, where it is moist and pliable; this will avoid dragging the ragged foreign mass clinging to the suture, through its whole long track and through the peritoneum. To get the suture out, catch its free ends in a pair of dressing-forceps and pull it up a little, and then carefully clip one side of the loop in the moist part; then remove it by pulling it toward the side on which it has been cut. If the pull is made in the opposite direction the tendency will be to drag the freshly-united surfaces apart.

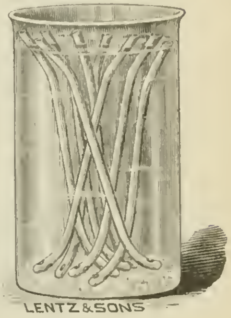
FIG. 3



Removal of the abdominal suture.

A shows the suture *in situ* passing through skin, muscle, and peritoneum. *CR*, *CR* are the little masses of incrustation of hardened lymph, discharged from the suture-track. *B* shows the removal of the suture, elevated and cut below the crust. *C* shows the direction in which it is to be pulled out.

FIG. 4.



Glass catheters.

I have for years used nothing but glass catheters, which are cheaper and cleaner than any others. Several of these can be conveniently kept in a large test-tube, closed with cotton and sterilized in the same manner as the ligatures. Or, they can be kept standing in a five-per-cent carbolic acid solution in a jar with some cotton on the bottom, to prevent them from breaking when dropped in. Each catheter should be washed thoroughly after using it, and preserved in the solution until wanted again. A sigmoid self-retaining catheter can be readily made from one of these over the alcohol lamp. My catheters are now in general use all over the country.

ASEPSIS AWAY FROM THE HOSPITAL.

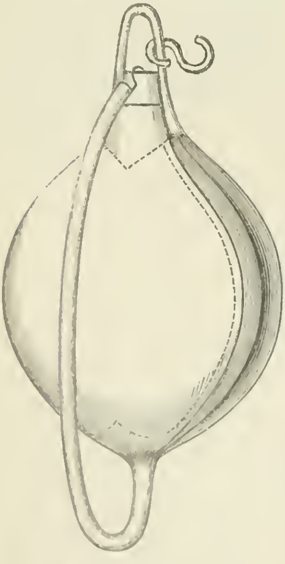
It is manifestly not very difficult with careful training amidst all the conveniences of a specially-prepared clinic, to keep up an aseptic condition for any given length of time.

A question of the utmost practical importance, which has not yet been answered, is, "How far can we successfully apply these principles to emergency cases, and to operations in private houses?"

The difficulties in the way of operating aseptically in private, especially among the poor and middle classes, are due, in part, to the unskilled voluntary assistants in the preliminary preparations, and to the use of various household vessels and utensils whose microscopic cleanliness is uncertain—thus, the water used, the boiler, the pitchers and the basins, and the towels are each and all open to grave suspicion. These sources of error in the technique are dangerous, and must hang like a pall on the conscience of a careful man. They can be avoided by the following simple devices. Instruments which have been sterilized are put at once in tin, copper, or nickel-plated boxes, and, together with the ligatures in the sterilized tubes, and the dressings wrapped in wax paper, should be carefully packed away in the operator's kit ready for a call at any moment. It is important to avoid using domestic towels, plates, and other dishes by providing one's self with instrument and ligature trays, of hard rubber, porcelain-coated, or glass.

A convenient and cheap dish for ligatures, needles, and needle-holder, is a clever adaptation of Dr. Robb's, consisting of a porcelain plate divided into sections large enough to hold all of these separately in the various compartments.

Fig. 5.



Collapsable rubber bag holding five quarts of water, used in place of a pitcher.

Three difficulties and inconsistencies remain to be overcome: the water, the boiler, and the pitchers, not one of which is safe for use as it is handed to us labelled "clean" by the housewife or servant. I have overcome this weakness in the technique by carrying a copper boiler with me, 11x16x10 inches, which just fills the leather case holding my instruments, trays, and dressings, all of which are thus packed into the boiler.

I use instead of pitchers a bag made of rubber, ending in a hose below, holding five quarts. This is hung up by the hook, and the water is drawn off by unhooking the hose hanging on the lip of the bag and letting the end down, when the water rushes out into the basin. Tap-water boiled for an hour is perfectly safe.

To such an extent has the elaborate technique of antiseptic surgery been simplified. Let no one imagine that there is any relaxation of the "antiseptic conscience." The appearance of laxity in dispensing, as far as possible, with antiseptic drugs, is in appearance only; the fact is, that in disposing of these means the necessity of keeping the principle constantly in view is all the greater and more urgent. If I shall have thus elucidated the principles and persuaded one man to exercise more care in securing and maintaining microscopic cleanliness in his work, and if by any simplification of the technique I have made the difficulties in the path of rigid scientific cleanliness seem a little less, I shall feel well rewarded for my efforts.

THE SURGICAL TREATMENT OF ANEURISM OF THE ARCUS AORTÆ, WITH A CASE CURED BY THE LORETA-BARWELL METHOD.

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The surgical treatment of aneurism of the first two-thirds of the arch of the aorta and anonyma deserves more consideration than the general practitioner is ready to grant it. The recognition of the disease has been generally associated with an absolutely hopeless prognosis. A more or less energetic trial of the improved Valsalva, or Tufnell-Balfour treatment, is made, and that failing, the patient is left to his fate. In view of the comparatively numerous favorable results obtained by surgical treatment in cases where the combined rest and iodide of potassium treatment failed and symptoms of immediate danger to life had appeared, hesitation to apply surgical measures seems unreasonable.

The term "Surgical Treatment of Aortic Aneurism" unites under its heading methods of great variety. Electrolysis, the introduction of various foreign bodies into the aneurism, alone or combined with the application of electricity, and last, but not least, the ligation of the right or left carotid and subclavian arteries, either simultaneously or separately, have been recommended. Most of these have given undoubted results in cases with the most urgent and dangerous symptoms. Brasdor's operation, the ligation of the carotid and subclavian arteries, shows the best record, especially if done simultaneously. In an essay that appeared about three years ago in Vol. xxxiv. Part I. of Langenbeck's *Archives of Surgery*, I have compiled all the cases of Brasdor's operation for aneurism of the arcus aortæ and anonyma up to 1885. Of the 38 simultaneous operations, 6 had been made before the time of Lister, 32 with antiseptic precautions. Of these 32 cases, 14 had lived one year and longer after the operation, able to work; 5 were greatly improved; 5 were not improved, and only 8 died within the week immediately following the operation. Similar, though not quite as favorable, results were obtained by the separate ligation of the two arteries, as also by the single ligation of either the right carotid or subclavian. Even the ligature of the left common carotid, in 6 cases of aneurism of the transverse part of the arcus aortæ, has given 2 cures of one year and longer, 2 improvements, and only 2 deaths.

Timothy Holmes operated October 21, 1875, on a woman, twenty-one years old, with large pulsating swellings in the first and second intercostal spaces, no pulsation in the arm arteries, and loss of voice in consequence of paralysis of one vocal cord. The pulsating tumor disappeared, she regained her voice completely, and in the meeting of the Royal Medical and Chirurgical Society of February, 1883, eight years after the operation, the operator spoke of her being at work at the time in a position as housekeeper. My own case of simultaneous ligature of the carotid and subclavian arteries, in a woman forty-two years old, is the second longest cure on record.

After having subjected my patient to a long but ineffectual treatment by other methods, I operated on her November 26, 1883. The case was brought, before and after operation, before the German Medical and the San Francisco Medical Societies. The woman is comfortable, and at work to-day.

The patient whose case I report has been operated upon by the Loreta-Barwell method, the introduction of wire into the aneurismal sac, combined with electrolysis. The excellent result obtained justifies my calling attention to it, and seems to me a unique illustration of the curative possibilities of modern surgery in these cases when assisted by youth and vigor.

Founded on Bacelli's recommendation of the introduction of fine watch-springs, Loreta originated the operation of introducing fine silver wire into aneurisms, and Barwell proposed to combine electrolysis with it. His first case, in 1886, proved unsuccessful; a second one was operated upon by Dr. Kerr with the same result. In a third case, however, a man of fifty-six years, he succeeded in improving the patient's condition materially, although swelling and pulsations remained.

My patient, born in 1864, showed an early but decided inclination toward obesity. When twelve years old he weighed 230 pounds, but reduced his weight after entering Harvard, November, 1882, by training for the class crew of 1886. The training consisted of rowing from four to ten miles daily, or exercises with chest-weights, dumb-bells, etc. Dietetic rules were to abstain from sweets, alcohol, and tobacco, and an urgent request made to retire by 10 o'clock at night. This last recommendation was rarely acted upon. Several practice races were rowed, until the great Columbia race in July, 1883, took place (at that time his weight was 185 pounds). The Harvard crew won under great strain. After coming home he suffered from palpitation of the heart, and Dr. Bennet, whom he consulted, thought there was an incipient aneurism. On his return to Cambridge he again began to row, but had soon to give it up and submit to treatment. By the beginning of 1885 the disagreeable symptoms had mostly disappeared. He retired from active engagement in athletic sports, but gained a prominent position in the fast set of Harvard. He became a devoted Lutheran; he loved wine, women, and song—the two former most. He consulted me for the first time in May, 1888, previous to an intended trip to New York. His weight at that time was between 250 and 260 pounds. He suffered from palpitations of the heart and slight dyspnœa. From my notes I glean that his pulse was weak (90) and somewhat irregular. I noticed a faint but distinct bruit, commencing over the second right intercostal space and extending to the right fossa supra-clavicularis. I gave him very strict directions about exercise and diet, and he left for New York. During the four months following until I saw him again, on October 13, 1888, he gave himself up to an unbroken series of excesses *in Baccho et Venere.* On that day he had what was described to me as a fainting-fit, and I was called in. He had gained some in flesh. His pulse was 100, very weak and intermittent, the right hardly perceptible. Upon examination, I found a distinct pulsating tumor occupying the second and third intercostal spaces in the right parasternal line; no discoloration of the skin. Percussion showed a dulness of about two inches square in that region. Auscultation revealed the usual aneurismatic bruit over the tumor. The apex-beat was obscured by the immense layer of fat, and percussion could not distinctly outline a suspected dilatation. The first sound seemed clear, the second was changed to a loud bruit. Absolute rest in bed was immediately ordered, and he was put on low liquid diet, with large doses of iodide of potassium and cautious massage of extremities.

This treatment was strictly kept up for three months without any apparent effect except that his solid flesh melted and his pulse gained more regularity. He suffered during this time excessive pains in his right shoulder and arm, and protracted attacks of suffocation, which, in several instances, necessitated inhalations of oxygen and the aid of artificial respiration. I had spoken to the family of the various surgical interferences and proposed to try simultaneous ligation of the carotid and subclavian arteries, but they very strongly objected to any cutting operation, and asked me to give electricity a complete trial first. On January 13, 1889, accordingly, I inserted an insulated needle, connected with the positive pole of a galvanic battery, into the aneurismal sac. An Apostoli electrode connected with the negative pole was placed over and to the left of the sternum; sixteen large-sized cells were used. The galvanometer showed about 70 milliampères, the current was applied during twenty minutes. On January 26th the operation was repeated with two needles. The effect of both operations was *nil.* As the symptoms grew rather more aggravated, after a consultation with my *confrères*, and assisted by Dr. Hahn, I performed the Loreta-Barwell operation on February 24th. I took an explorative trocar in order to be able to use a larger-sized wire than had been employed heretofore. I drew the skin from near the axillary line toward the tumor, penetrated and went into the aneurism. During six or seven minutes a slowly increasing current was directed through the trocar until the same number of elements was at work as before. The lance of the trocar was carefully withdrawn and about twenty-six inches of spirally wound, moderately thick, softened silver wire, such as would be used in trachelorrhaphy (about No. 28), introduced through the canula. I was fortunate enough to be able to push the wire perfectly into the sac with the lance, and after an electrolysis of about thirty minutes withdrew the trocar, carefully drawing the skin into its place again. The patient bore the operation remarkably well. Salt-bags were applied over the aneurism as at the two previous operations. After a few days the pains began to subside, and after two weeks the breathing became easy and no more attacks of suffocation occurred. There was a slight superficial sloughing of the skin where the trocar had entered and probably been imperfectly insulated, but no other untoward symptom followed. The tumor grew gradually smaller and harder, the pulsations less, until by April 15th they had entirely disappeared. The patient has been steadily improving; he is in the most excellent health, able to undergo any ordinary exercise, and weighs, with 6 feet in height and 43 inches around the chest, only 185 pounds.

The first sphygmographic tracings showed a marked influence of the, then existing, fatty infiltrations perhaps associated with degeneration of the heart-muscle (myocarditis). In the course of the Tufnell-Balfour treatment an improvement was witnessed. At the time of writing the sphygmograph shows yet a difference in the pulse of each side which the finger can hardly detect; but except this and a slight elevation and dulness on percussion at the former site of the aneurismal swelling, nothing remains to remind us of the former disease.

The excellent result obtained in this case is mainly due to the youth of the patient. Aneurisms of the arch of the aorta at his years are rare occurrences. The age over forty furnishes nearly all the cases, and arteries with atheromatous degeneration do not admit such a complete restitution of the normal type. I doubt very much if this operation should be recommended for persons of an advanced age with atheromatous degeneration. It would be better, after an ineffectual trial of simple electrolysis, if the symptoms are urgent, to perform simultaneous ligation after Brasdor. But something should be done in every case of aneurism of the arch of the aorta that does not yield to the Tufnell-Balfour treatment.

THE CORROSION METHOD IN THE STUDY OF THE ANATOMY OF THE EAR.[1]

By B. Alex. Randall, A.M., M.D.,
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The method of corroding away the tissues of an organ after filling its cavities with a congealing mass has been long and profitably employed in studying hollow structures, and most beautiful results have been thus obtained by many anatomists. Following the lead of Lieberkühn, Meckel, and others, Hyrtl made especial use of the procedure, and a fine series of his casts in wax, including some of the ear, is in the Mütter Museum. The ear, with its elaborate intricacy, is one of the organs in which the method can be most advantageously employed; and much has been done in this direction by Bezold, of Munich, whose valuable brochure upon the subject was published in 1882. Yet the method with wax was but a step in the advance to fine results; and the return to the use of fusible metal and the elaboration of the technique have furnished casts far more delicate, yet durable, than those before obtainable. Much credit for this advance, although a number of excellent casts made in metal by Dr. Goddard in 1831 may be seen in the Wister and Horner Museum, is due to Siebenmann, of Basle, who presented exquisite specimens of his work at the International Otological Congress in Brussels in 1888, and has since published an elaborate monograph upon the revelations thus made in the internal ear.

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[1] Abstract of a paper read before the College of Physicians of Philadelphia, Nov. 5th.

The writer was greatly impressed by the beauty of Siebenmann's specimens, and at once prepared to follow his example; but press of other work and lack of adequate material have long delayed the undertaking, and the preparations now presented form only a beginning of the series planned. It is hoped, however, that they will serve to bring the method into deserved notice, and that others will find how invaluable an aid it can be to them. Surely, in America, where perhaps fusible metal was first thus employed successfully, it ought to yield results second to none elsewhere obtained.

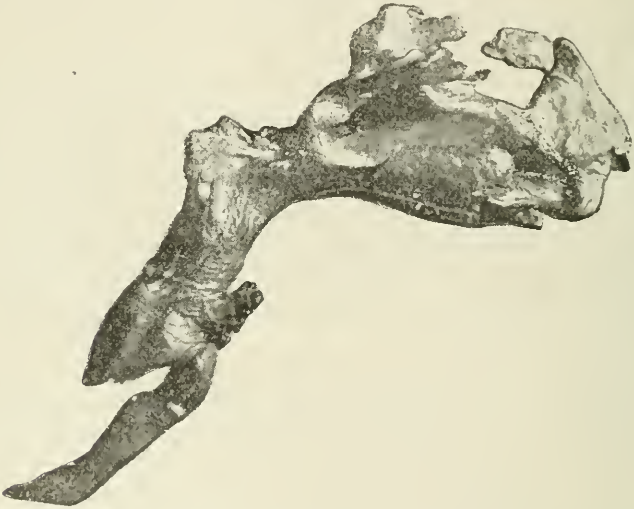
It is hardly necessary to point out that in this instance, contrary to what obtains in vascular preparations, the results gained are *negatives*, which represent the cavities, not the structures of the organ, and need for their full comprehension to be supplemented by preparations of the structures themselves. The important point is that they furnish tangible expressions of the details that are otherwise hardest to grasp; and as illustrating the value of such negatives, I can refer to the magnificent series of preparations by a similar but far more difficult and tedious method, with which Dr. Piersol captivated the Anatomical Congress in Wurzburg two years ago.

The essentials of the method are well known; but its minute details are noteworthy, since upon these refinements depends the perfection of modern results. The preliminaries vary with the organ to be moulded. If a macerated bone, such as the temporal, it is thoroughly dried and cleaned, is enclosed in linen so pasted on as to bridge the sulcus of the lateral sinus and other grooves, and to close all openings except the distal extremity of the carotid canal, into which a long paper funnel is glued. The whole is then imbedded in a large block of plaster, is thoroughly dried, and then warmed to about 200°. Wood's metal, a fusible alloy melting at 150° F., is melted upon a water-bath and poured in a full stream until the funnel is partly filled and the level ceases to sink. Quick cooling in water is followed by the removal of the plaster and linen envelopes, and the preparation is placed in a warm ten per cent. solution of caustic potash. Disintegration of the bone rapidly proceeds and will be largely accomplished in two weeks. The older procedure of picking away the remaining calcareous particles is too dangerous for the delicate portions of the cast, and is to be wholly avoided. The preparation is to be placed in a cold ten to fifteen per cent. solution of muriatic acid, which dissolves away the lime particles without injury to the metal beyond an occasional tarnishing. Superfluous metal is then cut away, and the specimen mounted for preservation. For the soft tissues, injection by means of a syringe is sometimes necessary, since it is hard to raise the organ to the proper temperature for free flow without macerating its surface too much.

An exquisitely minute injection of the tissues can be obtained by these means, and the resulting casts, while very delicate, will bear careful handling without fracture or distortion, and are admirably adapted for demonstration purposes.

The practical results of such preparations can be valuable in the extreme, not only from an anatomical point of view, but in their bearing on practice, as two of those presented well show. No amount of reading as to the form and continuity of the upper air-passages can possibly make as manifest their usual configuration and unity, as a cast obtained by pouring the metal into the trachea of the inverted head. The specimen (Fig. 1) is from a child of eight years, and falls far short of perfection; yet trachea, glottis, pharynx and nares are well shown, with clear indications of ventricles, fossæ of Rosenmüller, Eustachian tube-mouths, and other adnexa. Hardly any of the metal has found its way into the oral cavity, merely enough to outline the size and position of the uvula—showing how isolated the mouth really is from the air-passages. A more successful preparation of this sort, which should give as a single mass of metal the Eustachian tubes, tympana, and mastoid cells in their continuity with these upper air-passages, would teach a lesson in aural practice which many medical men have yet to learn. Still more instructive are the casts of the external auditory meatus, which are always viewed with scepticism at first, even by those having con-

FIG. 1.



siderable knowledge of the ear. The tortuous form natural to the canal as shown in some specimens (Fig. 2), can be largely done away by drawing the auricle up and back (Fig. 3); but the extreme obliquity of the drum-membrane and the widening of the inner third of the canal to form a pocket close beneath it, are anatomical facts too generally unknown. The cases are still numerous where grave injury is done by the surgeon in endeavoring to extract foreign bodies. Without illumination, ignorant of the anatomy, and armed only with improper instruments and a determination not to come out empty-handed, he will plunge in and force the foreign body, if present, through the drum-head; or, if there be no foreign body, will tear away the ossicles as such. Twenty ears have been seriously damaged, by efforts to remove a foreign body, to every one that has suffered from its undisturbed presence. The cast of the normal auditory canal cannot be withdrawn without damage to it or to the canal, as these specimens well illustrate; for thinking the casting a failure, I tried to withdraw the readily-movable mass After many failures, my utmost strength dragged it out (that of the other side broke off in the canal), and the repeated casting gives evidence of much laceration from the violence used. Yet this is in the undeveloped meatus of a child; in the adult either bone or metal would have to break. As the forcible extraction of any other impacted mass is as difficult and dangerous, the often-neglected rule that the syringe is the only safe means for use in such cases receives another clear confirmation.

FIG. 2.

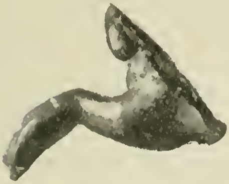
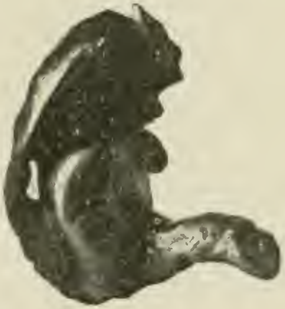


FIG. 3.



SOME IMPORTANT POINTS REGARDING THE APPENDIX VERMIFORMIS.

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THE following observations have been made during the past eight years, and cover a total of two hundred dissections, carefully performed for the purpose of elucidating certain points regarding this small and apparently unimportant bit of the human body.

The average length of the two hundred appendices was four and one-half inches; and the average diameter that of a No. 9 catheter, English scale. In three cases the appendices were only half an inch in length; while in only one case could it be said that it was entirely absent.

Of the entire two hundred examples, the appendix was supplied with a mesentery of its own, and so placed that its perforation would open directly into the peritoneal cavity, in one hundred and twenty-three. Of these one hundred and twenty-three, the appendix lay to the right of the cæcum in nineteen, descended downward in eleven, lay inward from the cæcum in eighteen, and behind the cæcum in the remaining seventy-five.

The other group of seventy-seven cases was specially interesting in the fact that the appendix was so placed and covered by peritoneum that its perforation would open into the subperitoneal tissue, and establish a diffuse form of cellulitis. In these cases the most likely course for the pus to pursue would be downward, and finally to present itself in the situation of a psoas abscess. One case is of great interest. A man of about forty, who had a discharging sinus in the above situation, died of an acute attack of pneumonia. A soft catheter could be passed up this sinus a distance of ten or eleven inches. On making a careful dissection of the sinus, it was traced to a perforated appendix, that lay behind the peritoneum in the position of the above seventy-seven. In reality this case was an example of a fæcal fistula.

Out of the two hundred cases examined there was evidence of old-standing lesions and perforations in seven. In three of these latter the proof, that at some prior date there had been a perforation, was quite positive.

Foreign bodies were found in fifteen of the two hundred. There were enteroliths in two; a small stone in one; a small bone in one; a piece of a screw nail in one, and such articles as orange-pips, cherry-stones, etc., in the other ten.

The above remarks are of some importance in showing that of the two hundred appendices, there were foreign bodies in fifteen; and that there were good signs of lesions in seven; three clearly having been of the character of a perforative appendicitis. This is very important, as pointing to the possibility of recovery after such a lesion of the appendix.

REVIEWS.

The Science and Art of Obstetrics. By Theophilus Parvin, M.D., LL.D., Professor of Obstetrics and Diseases of Women and Children in Jefferson Medical College, and one of the Obstetricians to the Philadelphia Hospital. Second edition revised and enlarged. Illustrated by two hundred and thirty-nine woodcuts and a colored plate. Philadelphia: Lea Brothers & Co., 1890.

A systematic treatise on obstetrics, which, alongside of able and worthy competitors for favor, runs through one edition and is succeeded by an elaborate revision in less than three years, requires no comment as a successful book. One of the most characteristic things about the first edition of Dr. Parvin's work was the cordial reception and large sale it received in England. Of course, we have got above caring for such things now, except so far as it may prove that our English-speaking brethren on the other side know and can appreciate a good book.

This edition, as comparison with the former shows, is in many senses of the word a new book. It is largely rewritten, and while the general arrangement is preserved, and the author's opinions, like the convictions of a mature student, but little changed, yet in its new matter it is brought down rigidly to date. As the first edition received extended notice as a whole in these pages, it may serve the reader's purpose to notice the new matter and alterations that characterize this edition.

The chapter on Pelvic Anomalies is entirely new, that on Ectopic Gestation chiefly so. The method of delivering the head in head-last labors may be regarded as new. Among the portions in which careful revision is to be noticed are those relating to the Cæsarean and Porro's operations. Hicks's method of manipulative version is given in full with illustrations of great practical value. A good deal has been changed and much added on Puerperal Septicaemia. Puerperal eclampsia is new in the theory of its origin. In the practical technique of the parturient there are marks of new work as in removal of retained placenta, and retention after delivery.

As some of the new and revised matter relates to what in obstetrics may be regarded as burning questions of the day, it will be worth our time to notice what our author has to say. The one first worthy of extended notice is that on ectopic pregnancy. The opinion of the author that will startle some readers is that 1 in 500 of all pregnancies is the actual proportion of the ectopic form. The author stands alone among observers in this large ratio, although he has evidently been to considerable trouble in collecting his data. Concerning the still vexed question of location Dr. Parvin is among the most positive of authors concerning the rarity of interstitial pregnancies, "as they are more frequent in medical journals than they are in autopsies or in abdominal sections." The author is not an advocate of what he terms the "American method of treatment," that by electricity, and quotes the words of an expert abdominal sectionist, that electricity ought to be restricted to cases refusing abdominal section, or where no one could be found capable of doing the operation. "I think," says the author, "that this is the most that ought now to be said in favor of the treatment by electricity." This certainly excludes the United States, for it may well be doubted if there is any locality known to the author, or to his expert either, where one may not find a man ready to make an abdominal section. But we believe it safe to say that no author or book is yet known to man with authority sufficiently weighty to wipe electricity out as a means of treating a suspected case of ectopic pregnancy of the early weeks. Tait, with the thunders of a surgical pontiff, has tried in vain, with the added weight of the abdominal sectionists of two hemispheres. Herbert Spencer says, that when a belief shows this power of survival there exists about it certain elements of truth. The trouble is that the surgeon can afford to be positive while the electrician cannot, but what he lacks in the way of demonstration he more than makes up in the force of his self-conviction.

The illustrations in that portion that is mainly new in the head-last delivery are of a higher character, and aid the text in a most efficient way. In contrasting two methods of delivery, that of the Wigand-Martin-Winckel method (pressure upon the after-coming head from above) and that of the Veit-Smellie (manual extraction), the author states after Eisenhart that the number of children living and of children that continued to live is seven times greater by the former than the latter, a statement which, if correct, ought to settle the method for all time.

The chapter on Cæsarean Section and its substitutes is one of the rewritten sections. We fear the hardest task the author attempts in the book is to clear up the confused terms designating the various operations made through the abdominal wall. We all know that the prefix *laparo* does not, in its etymological sense, mean an incision in the middle line, yet it has been in common use since 1811 by Fieldler, "who took it upon himself," as Dr. Harris says, "to extend the word over the whole abdomen." The author applies the term *gastro-hysterotomy* to the Cæsarean section, and *gastro*-hysterectomy for amputation of the organ as in Porro's operation. Dr. Parvin, like many other writers, believes that the method of uterine suturing explains the modern success of the Cæsarean operation. When Sänger first made a resection of the edges of the uterine incision it appeared as though there was a radical departure from the old method and that the improvement in results was a natural outcome. But the technique has reverted back to the old form, and the results are as good, if not better. The present deep and superficial sutures are "the great merit of Sänger's improvement," as the author says: but are not Sänger's any more than they belong to this humble reviewer. Who first put in deep sutures and then closed any intervening gaps with superficial ones, no man knows, but he lived generations before Sänger was born, and before German surgeons had made the whole field of surgery a directory of proper names. To our mind "the great improvement in the Cæsarean operation, an improvement which has given the operation in recent years a marvellous success," is not a mere matter of sutures, but because the operation is made by men skilled in gastrotomy and in clean surgery, and upon women not yet *in articulo mortis*. "If a choice of time can be made," says the author, "it is preferable to do the operation about the end of pregnancy, but before labor begins." What systematic author would have dared to write this even so recently as ten years ago? Yet this is what success has led to, and, also, this is what has led to success.

For this reason the operation of Porro, after the novelty had worn off, found itself replaced by its older rival, against which the charge could no longer be brought of a nearly total mortality. The Italian operation then found its natural field of usefulness. In the instances of a uterus damaged by traumatism, fibroma, or the complication of incoercible hæmorrhage, it largely serves to save life as an alternative in Cæsarean section. There does not appear any reason to doubt that Dr. Parvin has the mass of operators with him in this opinion of the two operations. The extreme dogma of Tait that Porro's operation "will revolutionize the obstetric art, and in two years we shall hear no more of craniotomy and evisceration," has produced no impression on the general mind, which, fortunately for humanity, is one of conservatism. The modification of Müller is the form the operation is done in, and, like the modern Cæsarean, the improvement is in the direction of simplicity.

Braxton Hicks's method in version is given with several well-executed cuts which give a very practical idea of the method. Compared with other recent works on obstetrics this section is the most complete of any, and for the first time in an American text-book this important manipulation is given the place it deserves. Considering the fact that Braxton Hicks's first article appeared thirty years ago, it was high time that it received the complete and practical illustration that it has in Dr. Parvin's second edition.

Puerperal septicæmia has been further elaborated, compared to the first edition, and a good deal changed in wording and arrangement.

The theory of eclampsia advanced by the author is new as to the theory of its origin, and appears capable of giving a reasonable explanation of the phenomenon. This theory is briefly expressed and is deserving of quotation: "The disease should be regarded as essentially a toxæmia, the poison resulting from a failure of one or more eliminating organs to exercise perfectly their function. By the light of this theory, possibly, we may see why in case of the death of the fœtus, if the eclamptic attacks occur in pregnancy, they cease, or if albuminuria has occurred it lessens or disappears. While the fœtus lived it was constantly throwing into the mother's blood materials which ought to be eliminated through her emunctories. But if the fœtus dies, this process no longer goes on, the mother has only to eliminate self-created poisons, and the organs concerned are adequate to this single work, though they failed when the double burden was cast upon them." As the albuminuric theory will not explain the condition even within the most ordinary experience, and the neurotic theory, although more difficult to reason down, also fails, the explanation of a toxæmia certainly makes clear some of the more obscure features of the disease.

It is not often in the notice of a second edition that so much can be said of the new matter that an author has laboriously added or re-written. The value of the work has certainly been increased, while its handy and compact form has in no way been impaired. E. V. DE W.

PROGRESSIVE EXERCISES IN PRACTICAL CHEMISTRY. By HENRY LEFFMANN, M.D., Ph.D., etc., and WILLIAM BEAM, M.A., etc. Philadelphia: P. Blakiston, Son & Co., 1890.

THIS little book is offered by its authors as a laboratory guide in inorganic chemistry, presumably for the use of medical students and in medical colleges. They state in the preface that "the usual method of laboratory instruction, consisting of practice in elementary qualitative analysis, does not seem to us adapted to the teaching of chemistry as contemplated in the curriculum of American medical colleges." To us their effort, offered here as an improvement or substitute, appears, however, entirely too elementary, and suitable only for teaching chemistry in high schools and general colleges.

It is to be hoped that, in the near future, elementary chemistry will be considered as a requisite feature of a student's store of knowledge on entering medical colleges, and that the *application of chemistry to medicine only* shall have to be taught to them, embracing the qualitative and quantitative analysis required by such a course.

We cannot fail, however, to praise the excellence of this little work for its practical, systematic, and lucid manner of arrangement, together with the many new experiments and apparatus added by its authors, notwithstanding that we are at variance with them as to its sphere of usefulness and the course of chemistry to be taught at medical schools.

L. W.

ESSENTIALS OF MINOR SURGERY, BANDAGING, AND VENEREAL DISEASES. By EDWARD MARTIN, A.M., M.D. Philadelphia: W. B. Saunders, 1890.

THIS compend is a good addenda to the same author's work on *Essentials of Surgery*. It gives the most frequently used bandages (illustrated), as made by the roller, handkerchief, plaster-of-Paris, and adhesive plasters; the more important knots and sutures (illustrated); the manner of using, and the proportions of the ordinary antiseptics. It gives good methods of preparing sponges, catgut, silk, dressing, and drainage, together with an excellent description of the proper preparations for an aseptic operation from its commencement to its termination. The portion devoted to the administration of anæsthetics is well illustrated and thoroughly practical. The uses and the methods of application of counter-irritants are explained, as well as the proper methods of hypodermic injections. The more important fracture-dressings are described with proper illustrations, as well as the most common luxations.

The portion devoted to venereal diseases comprises a short explanation of the technicalities, together with a statement of the methods of treatment of the three great divisions and their sequelæ.

With this outline the work is a great help to the busy student preparing for examination, and fully carries out its title. A. H.

PROGRESS

OF

MEDICAL SCIENCE.

THERAPEUTICS.

UNDER THE CHARGE OF

FRANCIS H. WILLIAMS, M.D.,

ASSISTANT PROFESSOR OF THERAPEUTICS IN HARVARD UNIVERSITY.

ANTISEPSIS OF THE INTESTINES.

CANTANI writes that there are two therapeutical reasons for the disinfection of the intestines: first, to destroy the injurious microörganisms, and secondly to destroy the ptomaïnes already produced by them.

Except in very rare cases, the destruction of the pathogenetic micrococci in the living body will never be realized. All that is required at present is to produce an unfavorable soil for the growth of the micrococci, so that their rapid reproduction may be checked or diminished.

The destruction of the living disease-germs in the intestines may be accomplished per os or per anum. Antiseptics may only be given by the mouth when they are not changed or absorbed by the stomach or upper part of the small intestine, so that they reach the ileum unchanged, which is almost always the seat of the disorder.

For this purpose doses of calomel have been used, but set aside as unpractical except in infections of milder form. Bouchard has recommended large doses (*ad* 100 gm. daily) of finely-powdered carbon, naphthalin, finely-powdered iodoform (*ad* 1 gm. daily), and bismuthi salicylatis.

These substances, given in sufficient amount, can effect an antiseptic action on the fæces, but not, since they are insoluble, on the walls of the intestines. A marked action on the typhoid processes by these drugs has not yet been fully demonstrated.

Disinfecting fluids like carbolic acid and corrosive sublimate, given per os, can never produce complete disinfection of the intestines. Even overlooking their poisonous effect on the system, they will never carry out their antiseptic purpose, because a part is already absorbed by the stomach and the remainder loses its antiseptic qualities before reaching its destination.

The only way left is per anum, which is also the shortest way to the intestines. This is the best way to apply antiseptic fluids which are intended to come in direct contact with disease-germs.

That the fluid injected is carried to the upper part of the duodenum is proved by injecting fluids which are not well borne by the stomach and which were vomited.

Since it has been proved that the injected fluid can be carried up to the higher loops of the intestine by means of a tube hanging from a reservoir two to four yards above the level of the patient, there can be no doubt of the advantages of this method of treatment.

Moreover, the injected fluid causes no irritation, which may be produced by every insoluble substance; besides there is no chemical or mechanical action on the stomach, neither are its functions disturbed. The fluid is brought into the intestines directly without being absorbed or changed at all.

In addition to the antiseptic action of these fluids we must not overlook others which are also valuable. By injecting a very cold fluid fever temperatures may be considerably lowered. In cases like cholera, accompanied by loss of heat, the temperature may be raised by injecting hot fluid, and vitality relatively restored. In this way the intestines are cleaned out and a large number of bacteria and ptomaïnes are ejected with the outflowing fluid. By this method the blood is diluted by absorption, which would not be possible to such a degree per os and thereby the excrements are eliminated with greater ease. The injected fluid thus becomes a true medium for washing out the entire system.

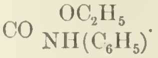
For antisepsis of the intestine all substances soluble in oil and water may be used, the same applies to astringent preparations, such as: Alum, salicylic preparations, thymol, aseptol, zincum sulphophenicum, boracic acid, hydrochloric acid, sulphite, and hyposulphite.

Cantani recommends gallic acid and carbolic acid Gallic acid has been successful in cases of intestinal catarrh with diarrhœa, also in true specific dysentery and typhoid fever. In cases of dysentery it may be desirable to add gum arabic to the acid or pure oil, on account of the painful condition of irritation. In the beginning of typhoid fever Cantani has prevented further development of the disease especially by using carbolic acid, 2 per cent. solution, with the addition of quinine hydrochloras.

In advanced stages of enteric enfeeblement, when the injected fluid will not rise, we are obliged to resort to the mouth as a means of reaching the duodenum, in which case naphthalin is to be preferred.—*Centralblatt f. d. gesammte Therapie*, Heft 9, 1890.

THERAPEUTIC ACTION OF EUPHORINE.

Euphorine is the name for phenylurethan given by PROF. GIACOSA, of which the chemical formula is



$$CO\begin{matrix}OC_2H_5\\NH(C_6H_5)\end{matrix}.$$

This combination is produced by the action of chlorocarbonic ether upon anilin. It is a white, crystalline powder, with slight aromatic odor and a taste at first hardly noticeable which afterward becomes sharper, resembling cloves.

According to Dr. L. Sansoni, euphorine is slightly soluble in cold water, very soluble in alcohol and in mixtures of water and alcohol, such as white wine. Small doses of euphorine are well borne by men and the higher animals. A drachm and a quarter injected into the stomach of a rabbit produced death in five hours, the animal having collapse, gradually-diminishing temperature, increasing weakness, and anæsthesia.

Euphorine has been used in various diseases, and has proved itself to be a remarkable antithermic, antiseptic, antirheumatic, and, in some cases, an analgesic remedy.

1. Antithermic action:

Euphorine is indicated in certain acute and chronic febrile diseases, such as typhoid, croupous pneumonia, tuberculosis of the lungs, acute rheumatic fever, orchitis, influenza, exudative pleurisy.

The temperature falls rapidly after the administration of the drug from one-half to one hour. The action of the drug is maintained from five to seven hours.

Strictly speaking, collapse has never been observed, even in cases in which the temperature sank below normal; only a collapse-temperature was observed, which condition is common to all antipyretics.

The antithermic action is not always constant, the same dose having different actions in different individuals. It is advisable to begin with small doses to test the tolerance of the patient.

Generally, in febrile disorders, 15 to 20 grains p. d. may be taken without unpleasant results. 7½ grains uphorine are equivalent to 15 grains antipyrine. It is advisable never to begin with a larger dose than 1½ grains.

2. Antirheumatic action:

It has been tried in acute and chronic rheumatism. The single dose must be higher in chronic cases than when given to reduce the temperature; the daily dose is from 20 to 30 grains, better in large single doses than in repeated small doses.

In acute rheumatism one has observed the diminution of pain—the spontaneous as well as that produced by movement or pressure. The cases of chronic rheumatism with which he experimented were those which had resisted other specific remedies. After giving euphorine there was a slight diminution of pain and a little more freedom of motion.

3. Analgesic action:

It has been tried in tabes dorsalis, neuralgia, orchitis, hemicrania, as an analgesic, with varying success. The dose must be 20 to 30 grains, or more, during twenty-four hours.

4. Prof. Giacosa has proved its antiseptic power. He has used it with remarkable results dusted over indolent ulcers and in chronic ophthalmia. In a few days a wound is improved in appearance, the surface becomes red, pus disappears, and granulation proceeds rapidly. Such a sure and quick action, accompanied only by a slight temporary pain, is the chief advantage of this new remedy.—*Therapeutische Monatshefte*, Heft 9, 1890.

On the Treatment of Diarrhœa with Lactic Acid.

After continued experiments, Dr. Hayem has found that lactic acid is well borne by the alimentary canal.

After large doses it appears in rather a short time in the urine and fæces, and thus proves that the acid given in a sufficiently large amount reaches the intestines unchanged and may act directly upon them.

Hayem has never observed digestive disturbances (flatulence, emesis, or diarrhœa) after daily doses of 2½ to 3¾ drachms.

He prescribes the remedy in the form of lemonade, as follows:

R.—Acidi lactici	10.0 to 15.0.
Aquæ destill.	800.0.
Syrup. simpl.	200.0.

Sig.—Take during twenty-four hours half a tumblerful between meals.

With this he had in almost all cases of diarrhœa excellent results. In tuberculosis accompanied by digestive disturbances he added daily one or two bottles of kefir (koumis). Also in diarrhœa of typhoid and in cholera nostras it proved successful. Otherwise lactic acid may be prescribed in cholera Asiatica. With reference to prophylaxis it may be given in doses of a drachm to a drachm and a half daily; otherwise, doses of 2½ to 5 drachms should be given, as early as possible, in twenty-four hours.—*Therapeutische Monatshefte*, Heft 9, 1890.

Tracheal Injections as a Way of Administering Remedies.

In view of the possibility of the advantages which the trachea may offer to the introduction of remedies for the treatment of respiratory diseases, it is worth while to note the report of M. Botey before the Académie des Sciences. The trachea is not popularly supposed to be willing to tolerate quietly the introduction of foreign liquids, but it has been shown that if the larynx be first anæsthetized with a ten-per-cent. cocaine solution, that, by means of a suitable syringe, water and solutions of various drugs may be introduced without exciting unpleasant symptoms. M. Botey injected two and a half drachms and, after eight days, about an ounce of distilled water into his own trachea without causing discomfort or coughing. His respirations were increased from seventeen to twenty-one, and his pulse from seventy-four to eighty-two. In a woman who had syphilis affecting the larynx and trachea, three drachms of a one-per-cent. solution of iodide of potassium were injected, and after a few days six drachms of this solution, containing also one-twenty-fifth of a grain of bichloride of mercury, were given in this way on every other day. These injections were repeated seventeen times successively. The treatment was well borne, and the patient made a good recovery. The only phenomena which were observed after these injections were a diminution in the number of respirations from twenty-three to eighteen per minute during several hours.—*Le Mercrédi Médicale*, No. 30, 1890.

Salipyrin.

Salipyrin is a chemical compound of antipyrine 57.7 per cent. and salicylic acid 43.3 per cent.; it is a white crystalline powder, without odor, dissolves in alcohol, but only to the extent of one-half of one per cent. in water.

It goes without saying that it is another antipyretic, and may be used in amounts up to ninety grains, beginning with thirty grains and following this at intervals of an hour each with fifteen grains. The temperature rises again after four or five hours, and is unaccompanied by a chill.

In acute rheumatism it has been found to reduce the pain and swelling, and it is of service, also, in chronic rheumatism.

Salipyrin is said not to have disagreeable accompaniments; ninety grains daily have been taken by some patients for one or two weeks. In one case there was an eruption, which disappeared in three or four days.

At present it is too expensive a remedy to be in much demand.—*Berliner klinische Wochenschrift*, No. 37, 1890.

Resorcin in Diphtheria.

Andeer has recently collected evidence in regard to the usefulness of resorcin as an antiseptic, and especially with reference to its employment in diphtheria.

Recent investigations have shown that this drug is a very active antiseptic, and harmless even in solutions containing ten per cent. of it. A ten-per-cent. solution in glycerin penetrates the tissues rapidly. At the St. Lazare Hospital it has proved serviceable in diphtheria.

It should be used every one or two hours, day and night, locally to the diseased spot. A spray of a five-per-cent. solution should be kept up in the patient's room, and, further, two to four teaspoonfuls of a two-per-cent. solution of resorcin in syr. terebinth. should be administered daily.

In diphtheria of the larynx resorcin is of little value.—*Centralblatt f. d. gesammte Therapie*, Heft 9, 1890.

AMYLHYDRATE.

The dose of this liquid is about a drachm, but it is not very soluble in water. A small teaspoonful may be given in a glass of beer, or the following may be used:

R.—Amylhydrate	ʒij.
Aq. destill. Aq. flor. aurant.	āā ℥ij.
Syr. cort. aurant.	℥j.—M.

Sig.—One-half at night.

—*Correspondenzblatt f. Schweizer Aerzte*, No. 18, 1890.

Treatment of Diphtheria.

To prevent the spread of the diphtheritic process, which may be better accomplished if we begin sufficiently early, local disinfection is the chief indication. With this end in view, Dr. Wolf, of Freiburg, has used the volatile oils, a class of remedies which he considers well adapted to this purpose, since Ziegler has shown that oil of peppermint, in the proportion of 1 to 300,000, prevents the growth of bacteria.

Menthol rubbed with sugar, in the proportion of 1 : 20 of sugar, or 1 : 10, may be applied by means of a brush to the site of the local inflammation, and is more efficacious in removing the membrane than menthol in solution.

The powder should be applied three or four times a day; on the second or at the latest on the third day the membrane disappears, and a clean, sharply-defined, depressed ulceration remains which heals rapidly under continued local use of the powder.

This treatment is not novel, but Dr. Wolf has employed it successfully for two years.—*Therapeutische Monatshefte*, Heft 9, 1890.

Iodine for Vomiting.

Iodine is useful to relieve the vomiting of pregnancy and also other forms of this distressing symptom, including that accompanying alcoholic gastritis. Ten drops of the tincture in four ounces of water, one-third of this after each meal, is the usual dose. It sometimes causes a pleasant sensation of warmth in the stomach which may last twenty or twenty-five minutes.—*Correspondenzblatt f. Schweizer Aerzte*, No. 18, 1890.

Solution of Iodoform in Olive Oil.

According to experiments made in Professor Binz's laboratory, olive oil will dissolve from two and one-half to three per cent. of iodoform.—*Therapeutische Monatshefte*, Heft 9, 1890.

Salt for Stings.

The pain and swelling following the stings of bees, wasps, and gnats may be relieved by rubbing-in salt moistened with water. The application should be repeated several times.—*Therapeutische Monatshefte*, Heft 9, 1890.

A Case of Acute Poisoning from Antipyrine.

The following case may serve well as a warning to practitioners who are in the habit of regarding antipyrine as a perfectly harmless remedy. A lady, twenty-two years old, took fifteen grains of antipyrine after her midday meal, and in about three minutes she complained of a peculiar pain in the back of the head. A few minutes later she had ringing in the ears and dizziness; this was followed by palpitation, dyspnœa, cold perspiration on the face, a sensation of warmth in the whole right side of the body and of cold in the whole of the left side. Disturbance of vision followed after about twenty minutes, and amaurosis, which continued half an hour and then slowly disappeared. Hyperæmia of the optic nerve and marked congestion of the conjunctiva were observed. There was cyanosis about the lips, the pulse was two hundred per minute, the respiration was rapid and labored, and speech was difficult.

After about an hour and a half there appeared, on the right side only, an exanthematous eruption; after a few hours there was severe vomiting.

The patient's condition improved gradually during the afternoon and evening, and no serious results followed.

She was given, apparently with good results, a grain and a half of caffeine every three hours.—*Centralblatt f. d. gesammte Therapie*, Heft 9, 1890.

Carbolized Oil Externally.

Dr. **Tresilian** has advised the use of carbolized oil in scabies (1 part carbolic acid to 15 parts olive oil). He asserts that it removes itching instantly without producing inflammation of the skin.

Even if it were possible to relieve the pain or to produce cure, Dr. Israel would still oppose its use on account of the possibility of general carbolic poisoning.

At the end of the year 1860, when the poisonous effects of this remedy were not sufficiently well known, it was much employed as an ointment in skin diseases. Different authorities reported cases of toxic symptoms, such as dizziness, dyspnœa, nausea, loss of consciousness, several minutes after its use; even death has occurred. The following cases will illustrate: Machin, in 1868, has reported two cases in which, after anointing the body with warm carbolic acid, death occurred in 2½ hours in a woman of sixty years, and in 60 hours in a girl twenty-one years old.

In recent times Lubrecht reported a case of a man, twenty-one years old, with scabies, who was rubbed with a solution of one ounce of carbolic acid in ten ounces of water. Five minutes after its use dizziness, pallor, and death occurred after two gasping respirations.

Finally, Koehler has seen death occur in a young man after previous symptoms of poisoning, for whom was prescribed the fifth part of a solution of 1 : 8. In the last case Hoppe-Seyler found carbolic acid in the blood. These cases are sufficient to show the rapid absorption and poisonous action of carbolic acid even in external applications. On this account one should avoid using carbolic acid in such a disease when there are other better and safer remedies in the field.—*Therapeutische Monatshefte*, Heft 9, 1890.

MEDICINE

UNDER THE CHARGE OF

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The Recognition of the Gonococcus.

Steinschneider (*Centralbl. f. d. med. Wissensch.*, 1890, No. 39, 710) maintains, in opposition to a statement of Fürbringer's, that the application of the Gram method of staining microörganisms is necessary to the satisfactory study of the gonococcus, inasmuch as the only positive characteristic of this coccus is that it is not stained by this method, while nearly all other diplococci found in the urethra are colored thereby.

These conclusions, which agree with those of Roux, are the result of the examination of eighty-six patients with acute and chronic gonorrhœa. The almost entire certainty of this test is rendered absolute by the observation of the further characteristic of the gonococci, namely, that they are found within the pus-cell.

THE CONTAGIOUSNESS OF LEPRA.

In the effort to throw further light on this subject, **WESENER** (*Centralbl. f. d. med. Wissensch.*, 1890, No. 39, 715) practised the introduction into the anterior chamber of the eyes of rabbits of small portions of leprous tissue, which had been kept for two and a half years in alcohol, and in which the bacilli were, beyond question, dead. An inflammatory reaction was brought about and the implanted piece entirely or partly absorbed. The bacilli, which retained their form and colorability, were taken up by cells, which did not remain only in the immediate neighborhood, but were even found in the region of the iris, ciliary body, and space of Fontana.

Since, now, the changes which take place on the introduction of living leprous tissue into the same locality are histologically and bacteriologically identical with those described as occurring after dead bacilli have been employed; and since the histological alterations are very similar to those seen after the introduction of finely-divided foreign bodies or dead tubercle bacilli, the author concludes that all experiments of this sort which have been claimed to prove the contagiousness of leprosy have been in reality of negative value.

TWO CASES OF FRIEDREICH'S ATAXIA.

C. H. **BROWN** (*Journ. Nerv. and Ment. Dis.*, 1890, No. 10) reports two cases of Friedreich's ataxia. In the first, a woman twenty-nine years of age at the time of reporting, there was a distinctly neurotic family history, though without direct inheritance or instance of the occurrence of the affection in her brothers or sisters. At the age of thirteen she had attacks of supposed malaria, and developed round shoulders and ungraceful movements and double lateral curvature. From the age of fifteen there were frequent attacks of headache, backache, and erratic pains in the extremities; the ungracefulness increased, falls became frequent, and ataxia rapidly developed. There had been profuse menstruation, flushings of the face, irregular action of the heart, polyuria, cold hands and feet, with chilblains in winter; attacks of pulsation in the groin and vulva.

Examination showed no mental derangement; ataxia of the lower extremities, rendering standing alone impossible; ataxia of the upper extremities and of the muscles of the face; ataxia of speech, rendering it slurring and rapid, with omission of labials. Tactile sense and temperature were good; weight-sense impaired; reflexes abolished. Ophthalmoscopic and electrical examinations negative; no evident paresis.

The second case, occurring in a woman aged twenty-eight years, has already been reported by Dana in 1887. When reëxamined in 1889 she was well nourished; could take a few steps when assisted. The limbs were not stiff; there were both ankle-clonus and tendon-reflex. The temperature-sense was good; the tactile sense a little affected; the muscle-sense poor, both in the lower and upper extremities; in the latter no reflexes could be obtained, and there was marked muscular weakness. The speech was slow but not ataxic. The electrical and ophthalmoscopic examinations were negative. There was no spinal curvature. In the earlier and more active stage of the disease in the history of this patient there had been decidedly spastic symptoms.

The author gives a very interesting discussion of the symptoms observed, and of the views of different writers with regard to the nature and cause of the affection.

CONTRIBUTION TO THE STUDY AND HISTORY OF WEIL'S DISEASE.

WEISS (*Centralbl. f. klin. Med.*, 1890, No. 38, 688) defines this disease as a suddenly-developing, acute, febrile affection, arising without discernible cause, accompanied by icterus, swelling of the liver and spleen, and renal and severe nervous symptoms, and running a short and favorable course. He reviews the cases which have been already reported, many of which he feels obliged to consider as not genuine examples of the disorder. He then reports a number of cases recently treated by him, as well as a large number of others which came under his observation in a small epidemic in 1866, and which he published under the title of "Infectious Icterus" before Weil's observations were made. As French authors also described it before Weil, he suggests that it be designated "*Typhus biliosus nostras.*"

The symptoms are of two classes—pathognomonic and accidental. To the first belong the sudden development of high fever, usually with chilliness or rigor; cerebral symptoms and muscular pains; disturbances of the digestive apparatus; icterus and swelling of the liver from biliary congestion; enlargement of the spleen; renal symptoms. To the second class belong cutaneous eruptions, as roseola, erythema, purpura, petechiæ, herpes labialis or nasalis, epistaxis, bronchitic symptoms.

Males are much more frequently affected, and usually between the ages of fifteen and thirty years. Most cases occur during the summer. The hygienic and sanitary conditions of places in which the disease has occurred have been recognized by all observers as bad. No positive case of direct transmission of the disease has as yet been observed.

As exciting causes there have been mentioned errors in diet, exposure to cold, over-exertion, ingestion of bad beer; but the true etiology of the disease has not yet been discovered, and the investigation of the blood for bacteria, carried out by some writers, has had but negative results. Though the affection has ended fatally, yet the prognosis is usually favorable. The recovery, however, is tedious. The severity depends upon the degree of the renal involvement.

THE AMŒBA COLI IN DYSENTERY.

LAFLEUR (*Johns-Hopkins Hosp. Bull.*, 1890, No. 7, 91) reports a case of dysentery in which the amœba coli were found in the stools. The patient, a man of twenty-seven years of age, a seaman, had been in the tropics for a short time in 1880, but not since. While at sea, two weeks before coming under observation, he had slight epistaxis, vomiting, and diarrhœa, and after a week numerous bloody stools, with tenesmus and abdominal pain. On admission to the hospital his stools were greenish-brown, watery, fœtid, and contained blood, mucus, shreddy detritus, and scattered masses of pus. Numerous amœbæ were found actively moving in the stools. They varied considerably in size, the average being five to seven times that of a leucocyte. They were pale bluish-green in color, and contained one to many small vacuoles surrounded by highly-refracting granular particles, the whole being invested by a homogeneous outer zone looking like finely-ground glass. In some it was possible to make out a circular nucleus. Several stools were examined every day, and amœbæ always discovered. Small grayish-yellow pus collections, which could be easily picked out with the forceps from the fluid part of the stools, exhibited the organisms to the best advantage. This is the second case of dysentery reported in this country in which the amœbæ have been found.

The Value of the Phenylhydracin Test for Sugar.

Hirschl (*Centralbl. f. d. med. Wissensch.*, 1890, No. 38, 691), in investigating the value of this test for sugar in the urine, found that out of forty-five different specimens of urine only four exhibited the characteristic yellow needles of phenylglucosazone, with a melting-point of 205° C., and that in these four urines the fermentation-test also gave a positive result. The other urines gave only the yellowish-brown masses, strongly refractive globules, and irregular thorn-apple forms of a melting-point of about 150° C., while the fermentation-test was negative. He therefore considers the phenylhydracin test reliable for sugar in the urine. Ten c.cm. of the urine should be mixed with twice as much of the reagent as will lie upon the point of a knife and with three times this unit of acetate of soda. This mixture should then be heated at least an hour on a water-bath, allowed to stand over-night, and the sediment examined microscopically. Levulose gives, it is true, the same osazone as grape-sugar. If, therefore, a polariscopic examination of the urine shows no deviation of the light to the right, the presence of levulose in the urine may be assumed. The combination of phenylhydracin with lactose produces bright-yellow needles ten times as wide as phenylglucosazone, while maltose produces an osazone in the form of broad, yellow plates of a melting-point of 82° C.

The Causes and Treatment of Chronic Constipation.

Kogerer (*Wien. klin. Wochenschr.*, 1890, No. 33, 638) says that, though a person whose bowels are regular will have one or two, or, rarely, even three, passages daily, it is possible for an individual to suffer from chronic constipa-and yet to have the bowels moved as frequently as this. In these cases the passages are only the overflow, while the greatest portion of the fæcal mass remains in the large intestine. It is to be borne in mind that such persons may even suffer from chronic diarrhœa.

In discussing the numerous causes of constipation, the author mentions as one of the chief the voluntary neglect of the natural inclination to stool. Among other causes are an insufficient ingestion of fluid; the loss from the economy of large amounts of water, as in profuse sweating, etc.; an insufficient secretion of the digestive juices, especially bile; the ingestion of certain drugs;

diseases of the brain and cord; hysteria, hypochondriasis, melancholia, neurasthenia, etc.; the occurrence of severe diseases; chronic intestinal catarrh; venous congestion in diseases of the heart, lungs, and liver; atrophy of the muscle of the large intestine, either primary or as a result of general cachexia; sedentary occupation. In general it can be said that conditions of irritation in the intestinal canal are accompanied by diarrhœa, and conditions of paralysis exhibit constipation. The external sphincter offers an exception to this, since, when there is abnormal irritability here, it prevents the fæcal matter from passing, while if it is paralyzed incontinence of fæces is liable to result. A spasmodic condition of this sphincter may, as is well known, occur in case of fissure. It may also be seen in diseases of the spinal cord involving the centre for the emptying of the large intestine, and it is possible for a similar condition to be due to cerebral affections or general neuroses. The author reports a case in which spasm of the external sphincter, with resulting obstinate constipation, was due to hysteria.

The evil results which may follow chronic constipation are legion. It is important, therefore, that the affection receive fuller attention than it has done. The diagnosis is by no means always easy; and the author relates two interesting cases, in one of which an abdominal section was performed, while in the other the diagnosis of carcinoma was made—both of them proving to be instances of chronic constipation merely. A rational therapy consists in discovering the cause of the condition, where possible, and in fulfilling the *indicatio morbi* by rendering the atonic intestinal muscle again capable of action by increasing the strength of the accessory muscles, as those of the abdominal walls, and by removing any spasmodic condition of the sphincter. A symptomatic treatment is only to be employed when neither of these ends can be attained. Atony of the muscle of the intestine or of the abdominal walls should be treated by massage, exercise, electricity, and hydrotherapy. The electrical current can best be applied by placing the anode in the rectum or on the lumbar spine and the kathode on the abdominal walls, or both electrodes in the latter position. Hydrotherapy for this affection consists in the rubbing of the abdomen with cold water, the use of cold douches, short cold sitz-baths, wet abdominal bandaging, and cold injections. The diet should be carefully regulated, so as to increase the amount of fluid ingested. The use of laxative mineral waters is not to be recommended, since the benefit obtained from them is only temporary. Spasmodic conditions of the sphincter can best be treated by a "rectal cooler" (Artzberger's), which acts both mechanically and thermically.

CARDIO-VASCULAR VERTIGO.

GRASSET (*Memorabilien*, 1890, 9, 539, from *Sem. Méd.*) says that this form of vertigo, which he distinguishes from other forms under the name of cardio-vascular, commonly occurs associated with the symptoms of cerebral thrombosis. It is a symptom of temporary disturbance of the circulation in the vessels of the brain. It is commonly one of the first symptoms of commencing arterio-sclerosis. This form of vertigo is common, since that seen in gout and rheumatism, and as a result of chronic intoxication with tobacco. alcohol, etc. is nothing other than the vertigo of arterio-sclerosis.

The early appearance of the symptom is of great importance, since it permits of the employment of suitable prophylactic measures, directed against a development of arterio-sclerosis in the different viscera, which would result in softening in the brain, sclerosis of the cord, the characteristic involvement of the heart and kidneys, etc.

Cardio-vascular vertigo is generally a chronic affection, lasting for years with more or less well-marked exacerbations arising without evident cause.

At times it is associated with other transitory symptoms, such as hemiparesis, amnesia, fatigue, aphasia. As regards the differential diagnosis, it is to be borne in mind that in general the different varieties of vertigo exhibit no clinical difference. The diagnosis rests upon the nature of the concomitant symptoms. Thus the coexistence of dyspeptic disturbances points toward gastric vertigo; optic or auditory affections toward the corresponding variety of vertigo, while the diagnosis of cardio-vascular vertigo may be made, when besides the physical and functional symptoms, there exist a sensation of pressure, dyspnœa on exertion, palpitation, præcordial anxiety, circumscribed coldness of different parts of the body, headache, insomnia, atony of the radial and temporal vessels, etc. The most characteristic symptom is always the accentuation of the aortic second sound.

The treatment of cardio-vascular vertigo consists principally in diminishing the tension of the vessel-walls; and for this purpose iodide of sodium and nitro-glycerin are indicated. The first, in doses of 15 grains daily, must be continuously administered during months before discarded as useless. The second, in doses of 4 drops of a 1 per cent. solution twice daily, is very valuable for diminishing the blood-pressure. The two drugs may be given together, or the iodide may be administered during the first 20 days of the month, and the nitro-glycerin during the last 10. It is especially important, too, that a strict hygiene be prescribed. Above all, the employment is to be forbidden of all those things which favor the development of arterio-sclerosis, such as tobacco, alcohol, solid flesh, etc. The patient should practise bodily exercise, live much in the open air, and consume milk, tender flesh, and leguminous vegetables. If epileptiform attacks accompany the vertigo, bromide of soda also should be given in doses of two to three grains daily. In cases where there is loss of strength arsenite of sodium is of value.

Vertigo of Bulbar Origin.

Buzzard (*Lancet*, June 25, 1890) admits the existence of Ménière's disease, but thinks that it is the too common habit to attribute to an affection of the labyrinth all cases in which there is paroxysmal vertigo accompanied by deafness and ringing in the ears. The author's belief has long been that in perhaps the majority of these cases it is through the centre in the medulla oblongata that the nerve is affected, and not at its periphery. Of the ten cases published by Ménière, an autopsy was made in only one, and there are but very few other cases in which the diagnosis was confirmed by autopsy.

The author relates an interesting case of a physician, forty-three years of age, who was suddenly attacked on waking with giddiness without deafness or tinnitus. While the head was perfectly still he was free from the trouble, but with the slightest turn it came on again. After some weeks he recovered, but was again after a time attacked with faintness, lasting a couple of hours and accompanied by profuse sweating, and a similar attack occurred on the next day. In these attacks he did not lose consciousness, but felt as if his heart was not acting, and was unable to lower the head to the right—as in looking up at something to the left above him—without giddiness, though he was able to move it rapidly from side to side, or to stoop down. Immediately after the attack he passed a large quantity of colorless urine.

The character of the vertigo in this case was distinctly auditory, the faintness was probably due to inhibition of the heart's action through the vagus, and the profuse sweating and large discharge of urine to irritation of centres in the medulla. Thus the legitimate inference seems to be that the nucleus of the vagus, the auditory nucleus, and the vaso-motor centre in the bulb, were all subject to some irritating influence.

There is reason to believe that irritation exerted in this region would produce just such disturbance of functions. Irritation applied to any part of the fifth nerve, even to the nucleus in the medulla, gives rise to pain, referred, according to the law of peripheral perception, to the periphery; and it is just as reasonable that irritation applied to the fibres or to the nucleus of the auditory nerve—a nerve of special sense—will give rise to perturbed action in the organs supplied by that nerve—vertigo if the part supplying the semicircular canals be affected; tinnitus, if the part going to the cochlear portion. It has been found, in fact, as regards another of the bulbar nerves, that in every case of tabes with gastric or laryngeal crises, and in which the medulla has been examined, there exists sclerosis in the neighborhood of the vagal nuclei.

Buzzard then reports several other interesting cases bearing upon the subject in question. In one of these, which appeared to have all the symptoms of Ménière's disease, the patient was nearly "stone-deaf" during the attacks. It is clear that this paroxysmal deafness could not be due to organic disease of the internal ear.

Cases of the kind described are very numerous. In such cases sometimes one nerve-centre and sometimes another seems to bear the brunt of the transient influence exerted upon the bulb. In some instances there are violent attacks of vertigo with auditory symptoms, while in others there may be an attack of irregularity of the heart's action, comparable in suddenness and violence with the vertigo, which it apparently replaces; or the sensory function of the fifth nerve may be attacked, and the patient suffer from paroxysmal neuralgia.

As regards the nature of the influence acting upon the bulb we are not yet in a position to speak with any positiveness. The fact that so many of the patients are clearly gouty offers some reason to think that it may be the presence in the blood of an uric-acid salt, or some equivalent, which is acting as the irritative agent.

It has long been the author's practice to prescribe salicylate of sodium in cases of vertigo associated with auditory nerve symptoms. He does this partly because the drug possesses an influence on the elimination of uric acid, and partly because it appears to exert some direct influence upon the centres in the medulla oblongata.

SURGERY.

UNDER THE CHARGE OF

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SURGEON TO THE GYNECEAN AND GERMAN HOSPITALS.

GUNSHOT WOUNDS OF THE CHEST AND WRIST.

G. S. THOMPSON (*The Lancet*, No. 13 of vol. ii., 1890, p. 661) reports a case of gunshot wound of the chest and wrist-joint, followed by complete recovery. The patient, a cavalry officer, was shot by a Martini-Henry carbine. One bullet entered the chest on the left side behind, at the level of the ninth rib below the angle of the scapula, and three inches from the spinal column. It traversed the chest and made its exit one inch below the left clavicle and three inches from the intraclavicular notch. Air bubbled from the anterior wound with a hissing sound during the movements of respiration. There were slight pain and difficulty of breathing. There was no hæmoptysis, wound emphysema, or internal hæmorrhage. The patient was at ease except for a sense of oppression and a slight pain behind the sternum during swallowing. The chest wounds were carefully examined by the finger for bleeding-points, damaged ribs, and foreign bodies. They were then washed out with an iodine solution and dressed antiseptically. The second bullet entered at the root of the thumb, between the radial artery and the median nerve, and external to the pisiform bone. It made exit half an inch external to the styloid process of the ulna and just over the wrist-joint. This wound was dressed in a similar way. The patient recovered with perfect use of the wrist.

The author remarks that none of the usual and what are commonly regarded as pathognomonic signs of wound of the lung were present in this case, except escape of air from the wound of exit and pain in the chest.

CYST OF THE PANCREAS.

TREVES (*The Lancet*, No. 13 of vol. ii., 1890, p. 655) reports a case of cyst of the pancreas which was cured by operation. The symptoms presented by the patient were indefinite in character. He was a vigorous, muscular man who had always been well until seven months before. He then noticed a throbbing sensation in the region of the umbilicus which was perceptible only when he lay upon the abdomen, and which ceased when he altered his position. A little later he noticed that he became tired sooner than usual, and had occasional dragging pains starting from the right testicle and spreading over the abdomen. He continued to work until five weeks before his admission to the hospital, when a tumor was discovered in the region of the umbilicus for the first time. It was the size of two large fists, was rounded, and free from pulsation. When admitted to the hospital he was in the following condition: He had lost but little in weight; he had some nausea, but had never vomited; the bowels were regular, and the stools normal in appearance; there was no jaundice; the urine contained one-twelfth of albumin; there was neither hiccough nor disturbance of respiration; the tongue was clean. He appeared very weak and depressed, and exhibited the utmost lassitude. The eyes were sunken, and the expression was that of utter and hopeless melancholy. The complexion was of a dirty-brown color, not unlike fading sunburn; this color was limited to the face, and attracted immediate attention. The pupils were responsive to light, though they were contracted almost to pin-holes. He spoke like a man who is intensely drowsy. In the abdomen was a median tumor; its upper limit was three inches above the umbilicus and below it reached to the pubis; it occupied nearly the whole of the front of the abdomen. Before operation the idea of a cyst was never entertained; the mass appeared to be solid and heavy.

The abdomen was opened in the median line below the umbilicus. A greatly-distended cyst was immediately exposed; it was placed behind the peritoneum of the posterior parietes; the reflections of the peritoneum from the sides of the tumor onto the kidney and the meso-colon being noticed. The growth was in close contact with the spine as far as the fourth lumbar vertebra. The small intestines were, for the most part, below the tumor. The omentum, transverse colon, and stomach were above it. The tenseness of the cyst was remarkable; when punctured, a jet of fluid was projected with great violence. The cyst was freely opened, and the margins were attached to the parietal wound. A large drainage-tube was introduced in the cyst. Convalescence was easy. In three months the external wound was closed and the cyst obliterated. About one hundred ounces of fluid were contained in the cyst; it was thick, opaque, and of a brownish-red color; it was alkaline, contained many blood-corpuscles, some albumin, but no bile and no urea.

Treves thinks that Senn's statement that "a positive diagnosis of a cyst of the pancreas is impossible," must be modified, and that, with the knowledge we now possess, there is no reason why the condition should not, in all uncomplicated cases, be recognized.

TAIT'S FLAP-SPLITTING OPERATION FOR INCONTINENCE OF FÆCES.

HOOPER (*Australian Medical Journal*, vol. xii. No. 8, p. 353) reports a case of incontinence of fæces from injury to the sphincter ani, which was cured by Tait's operation on the perineum. The patient, a woman, had been operated on in 1883 for external hæmorrhoids. This operation was followed by a rectal abscess. In 1884 she was operated on for fistula. In 1885 she was cauterized about the anus on account of the intense pain which attended the daily evacuations. One month later she was etherized and free incisions were made about the perineum. From this time all her symptoms increased in severity; she had complete incontinence of fæces and a constant discharge of mucus and pus from the bowel.

Examination showed that the perineum was practically absent, being represented only by a thin muscular septum between the vagina and rectum. The external sphincter was useless. There were three sinuses about the anus. Tait's flap-splitting operation was resorted to to repair this mutilation, with a perfect result. As the writer says, this case furnished a crucial test of the value of Tait's operation.

BRAIN SURGERY.

WALKER (*Med. and Surg. Reporter*, vol. lxiii. No. 8, p. 213) reports eleven cases of brain surgery.

There were two cases of compound fracture of the skull in which fragments of bone were driven through the dura mater into the brain. Trephining was performed and the fragments of bone were removed, with recovery in both cases. There were three cases of fracture of the base of the skull accompanied by intracranial hæmorrhage. The indications for trephining were the pressure-symptoms. Two of these cases recovered. There was one case of intracranial hæmorrhage without fracture. Trephining was performed six days after the injury and five ounces of coagulated blood were removed from between the skull and dura mater. The patient recovered.

There were two cases which received no benefit from operation: one was a case of supposed ancient intracranial hæmorrhage and the other a case of epilepsy.

The lateral ventricles were tapped for effusion in one case. The method of operating was that proposed by Keen. The trephine was placed 1¼ inches behind the meatus and 1¼ inches above Reid's base-line; the puncture being made toward a point 2½ inches directly above the opposite meatus. A considerable quantity of serous fluid was removed in this way; the patient, however, died in seven hours. The reporter is of the opinion that death was due to compression from hæmorrhage, which was caused by the operation. No autopsy was made. There was one successful case of trephining for epilepsy, which followed traumatism four years previous to operation.

Finally, there was a fatal case of operation for brain tumor. The tumor was not discovered at the operation. The autopsy showed it to be a cyst which had its origin at the apex of the petrous portion of the temporal bone.

CHOLECYSTOTOMY.

HALL (*Cincinnati Lancet-Clinic*, New Series, vol. xxv., No. 14, p. 405) reports a case of cholecystotomy for obstruction of the common duct by an impacted gall-stone. The operation was performed in the usual way: five stones being removed, four from the gall-bladder and one from the common duct. The gall-bladder was stitched to the abdominal incision. The fistula closed in twenty-one days, and remained closed for over a month; all symptoms of obstruction to the flow of bile having disappeared. Two months after the first operation the gall-bladder again became distended, and over a pint of bile was removed through a second incision. The patient continued to suffer with repeated attacks of obstruction, and died of exhaustion four months after the primary operation.

At the autopsy a stone was found in the common duct. The author thinks that this stone was in the hepatic duct at the time of the operation, and subsequently passed into the common duct. A second operation was not performed, because, during life, it was supposed that the repeated attacks of obstruction were caused by a stricture of the duct, and not to obstruction by a stone.

SURGICAL TREATMENT OF DEFORMITIES DUE TO PARALYSIS.

ADAMS (*The Lancet*, No. 13 of vol. ii., 1890, p. 653) discusses this subject in a lecture delivered at the National Hospital for the Paralyzed and Epileptic. He advises the use of massage and passive movements in the early stages of muscular contraction; in severe cases subcutaneous tenotomy. He points out the danger of making a large open wound when dividing the tendo-Achillis in cases accompanied by spasmodic rigidity. The assistant who has charge of the foot should be aware that in these cases the anterior muscles are sometimes thrown into violent spasmodic contraction as soon as the tendon is divided.

The general principles of treatment are:

1. Subcutaneous division of all the contracted tendons.
2. Gradual, rather than immediate, or rapid, mechanical extension.
3. Physiological means to promote the restoration of muscular power.
4. Mechanical supports adapted to the requirements of the case.

CHOLECYSTOTOMY.

Three cases of cholecystotomy are reported in the *Australian Medical Journal*, vol. xii., No. 8, p. 359. The first case is reported by C. S. RYAN. The patient had had an attack of jaundice seven years before the operation, and since then had suffered with pain in the region of the gall-bladder. A distinct pear-shaped tumor could be felt in the region of the gall-bladder. Cholecystotomy was performed, and a large stone was found impacted in the common duct. The gall-bladder was stitched to the abdominal incision. The patient made an uninterrupted recovery. The reporter calls attention to the fact that Mr. Tait divides all cases of enlarged gall-bladder into two clinical divisions: first, those cases which are not accompanied by jaundice, when the obstruction is in the cystic duct; and secondly, those cases in which there is a multiple collection of stones, usually accompanied by jaundice. The case just reported belonged to the first class. The prognosis in the second class is naturally more grave, on account of the greater systemic disturbance caused by the jaundice, and also on account of the altered condition of the blood, which leads to hæmorrhage.

The second case is reported by W. MOORE. The patient had suffered for seven years, dating his sickness from a fall from a buggy, the wheel of which passed over his body in the region of the liver. He had had several attacks of jaundice, during one of which the operation was performed. The gall-bladder was found to be much distended with fluid; the liquid contents were removed by the aspirator, and 170 small gall-stones of varying size and shape were removed by the finger and a lithotomy scoop. The gall-bladder was stitched to the abdominal incision. The patient died in two days of septic peritonitis. The case was an unfavorable one for operation on account of the long duration of the illness, and the repeated attacks of jaundice.

The third case is reported by MR. BALLS-HEADLEY. The patient had suffered for seven months before operation with a tumor in the right hypochondrium, and dragging and aching pains. She had not had jaundice. Examination showed a fluctuating and freely-movable tumor in the region of the gall-bladder. The abdomen was opened and six ounces of dense bilious fluid were removed by a trocar. The opening in the gall-bladder was then enlarged, and the cavity was explored by the finger. The walls of the gall-bladder were stitched to the abdominal walls, and twenty-five gall-stones were removed with the finger and forceps. A remaining stone was felt high up, under the right ribs, impacted in the cystic duct. It was found impossible to remove this stone. The patient recovered without difficulty. The biliary fistula, however, remained opened, and eight months after operation it was still discharging about half an ounce of clear mucus a day, and the stone could be felt by a probe to be in the same place.

In the discussion which followed the reports of these cases the question was raised between cholecystectomy and cholecystotomy. Mr. Lawson Tait, from his own personal experience, is strongly in favor of cholecystotomy.

RESULTS OF THE TREATMENT OF HIP-JOINT DISEASE BY THOMAS'S SPLINT.

RIDLON (*New York Medical Journal*, vol. lii., No. 14) communicates the results of his observations upon 62 cases of hip disease treated by Thomas; these cases were seen during a twelve-days' stay at Liverpool, and represent rather a picture of Thomas's daily work than of the final results of treatment. Of the observed cases the average duration of limp before treatment was commenced was a little over ten months. Contrary to what is generally believed, it was found that the long splint—that is, the one extending from the lower angle of the scapula to the lower third of the leg—had not always been put on at the beginning of treatment, but that the short splint which does not lock the knee had been used instead. In some cases the short splint had been replaced later by a long splint, but in others its use had been continued throughout the entire course of treatment. Nearly all the patients were found walking around without the high shoe and crutches, and it was common to allow patients to walk before deformity had been overcome, and while muscular spasm and deformity, and sometimes pain, still persisted. Of the 58 patients who had been under treatment for a longer or shorter time 23 had at some period of their course, some before, but many after treatment had been commenced, suffered from abscesses. Of these, one had disappeared without opening, and another was undergoing rapid absorption. There were 27 cases which were either cured or were so well advanced in convalescence that it was not thought dangerous to test mobility thoroughly. Of these, 12 had no motion, 10 had slight motion, 2 had motion of 90 degrees, and 3 had normal motion. It is, of course, impossible to formulate conclusions after a short observation of comparatively few cases, but Ridlon states as his general impression that very many of the patients who have had the short splint applied before muscular spasm and pain had subsided and before deformity was reduced, and who have been allowed to walk without a high shoe and crutches, present a moderate degree of adduction, absence of motion, and in a few cases slight flexion. On the other hand, patients who have worn the long splint until cured, who have remained in the horizontal position until all pain and muscular spasm subsided, who have then used the high shoe and crutches, and who have been carefully watched and nursed, have been cured without flexion and without deformity other than that due to bone erosion and arrested growth. Moreover, in these cases motion has been free, and, in some instances, even normal. Finally, those patients who have had no traction are found to be singularly free from the conditions which it is commonly believed are to be relieved only by long-continued traction.

LATERAL DEVIATION OF THE SPINE AS DIAGNOSTIC OF POTT'S DISEASE.

On the basis of Bartow's observation as to the frequency with which lateral deviation of the spine is found in cases of dorsal and lumbar Pott's disease, LOVETT (*The Boston Medical and Surgical Journal*, vol. cxxiii., No. 15) made careful observations upon some thirty cases of spinal caries. He finds that in untreated cases the presence of lateral deviation is universal. This deformity is least characteristic when the disease involves the cervical vertebræ; but in all other cases, if the patient be stripped and inspected from in front when standing as squarely as he can hold himself, it will be found that a perceptible degree of deviation of the spinal column is present. This is much more readily perceived in this way than when the back alone is inspected. The picture presented is not like that of rotary lateral curvature. There is a distinct leaning of the body toward one side or the other, rather than a sinuous distortion. This leaning is most frequently toward the right, and is of diagnostic value because it is one of the earliest symptoms of Pott's disease. In several cases it could be distinctly perceived when other symptoms were slight and ill-marked. Rotation was never very marked, being in no way comparable to that found in true scoliosis. When observed, it was often found not to follow the same rule as in scoliosis—that is, rotating backward on the side of the convexity of the curve. In a third of the cases the rotation was in the opposite direction. The lateral deviation was much more noticeable in the standing than in the lying position, and is probably due to reflex muscular spasm.

MUSCLE-TRANSPLANTATION.

The experimental research of GLUCK (*Deutsch med. Woch.*, No. 17, 1890), which seems to show that comparatively large pieces of muscle could be transplanted and maintain their vitality and physiological functions, leads him to conclusions so entirely opposite to generally accepted histological and pathological teachings that MAGNUS (*Münch. med. Woch.*, No. 30, xxxvii. Jahrg.) conducted a series of test-experiments. As a result he finds that, after excision of a portion of muscle and repairing the defect by muscle taken from an animal of the same species, if the seat of operation remains sterile the transplanted fragment apparently retains its vitality and becomes physiologically active, since examination two months after operation shows no difference microscopically or functionally between the transplanted tissue and its normal environment. If, however, the seat of operation is examined earlier, he finds that the transplanted muscle undergoes complete degeneration and absorption, the resultant defect being finally filled in by organization of muscular tissue originating and extending from the living surrounding muscle. When a great part of a muscle was removed and its place supplied by transplanted tissue, there resulted simply a fibrous cord, thus showing that though each muscle has undoubted regenerative power, such power is limited. It must follow, from this, that the wisdom of muscle-implantation with the idea of thus piecing-out defects caused by wounds or operations can be seriously questioned; though experiments would seem to show that such grafts may be useful when employed for the purpose of bridging defects in the continuity of muscles or tendons.

OTOLOGY.

UNDER THE CHARGE OF

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Bezold's Form of Mastoid Disease and Thrombosis of the Lateral Sinus.

Prof. S. Moos, of Heidelberg, reports four cases of this interesting and important disease (*Archives of Otology*, vol. xix. p. 161, April–July, 1890).

Bezold's form of mastoid disease is that in which the abscess opens in the digital fossa or *inner* surface of the mastoid process. The pus then accumulates beneath the cervical fasciæ, and large, painful, burrowing abscesses occur in the side of the neck (gravitative abscess). The diagnosis may be difficult in the early stages of the disease. "A hard, painful swelling in the retromaxillary fossa, often devoid of redness, may be the only symptom at the commencement, the mastoid process being apparently unchanged, without any infiltration of the overlying integument, and even showing scarcely any sensitiveness to pressure, though usually this is elicited upon percussion. Elevation of temperature may be absent in the early stages or may be transient and insignificant." This form of mastoid disease occurs usually with acute or subacute inflammations in the middle ear, and Moos regards it as the most serious form.

In Moos's first two cases the sclerosed mastoid was chiselled away to the extent of one centimetre in diameter, and pus was found beneath the skin and fasciæ. The first case recovered from the aural malady, but died of pulmonary tuberculosis four months later, and the second case died some weeks after the operation of cerebellar abscess. There was severe vertigo, even when in the recumbent position, vomiting, and obstinate constipation.

No autopsy. The third case died from septicæmia. On account of the great difficulty in chiselling away the mastoid process, Moos then determined, in subsequent cases of Bezold's mastoid disease, simply to open the antrum, "hoping to meet the indications by the easier method."

Therefore, in a case of otitis media purulenta of the left side (probably recent), with swelling in the retro-maxillary fossa, and longitudinal narrowing of the external auditory canal as the only symptoms of mastoiditis, and in which pyæmia occurred before and after the operation, with symptoms of *thrombosis of the lateral sinus*, the operation with the chisel and mallet was performed on the mastoid in the usual way and the antrum laid open, by applying the chisel at the level of the *spina supra meatum*, and advancing downward and forward from above and behind to a depth of two centimetres, when pus was reached in the antrum. Irrigation with a sublimate solution was then kept up for a month, when the pyæmic symptoms disappeared. There were at one time symptoms of embolic pneumonia.

Moos maintains that, when thrombosis of the lateral sinus exists or is suspected, the mastoid process should be trephined, because, as thrombosis of the lateral sinus may be recovered from if the patient overcomes the consequences of the breaking-down of the thrombus, and as these consequences can be escaped the more readily if the cause is removed, therefore, operative interference in thrombosis of the lateral sinus would be likely to yield more favorable results than the treatment by cinchona and wine hitherto relied on. By such an operation on the mastoid the pyæmic focus is attacked and the number of cocci in the blood diminished to a quantity compatible with life, until they are all overcome by antiseptics.

Ruptures of the Membrana Tympani, with Especial Reference to their Forensic Importance.

Dr. Leopold Treitel, of Breslau, Germany, has contributed an article on this important topic in the *Archives of Otology*, April–July, 1890. He reports observations of eighteen cases, occurring between March, 1887, and April, 1888.

Among these eighteen cases there were but two of perforation of the membrana by direct injury. These two accidents happened from the insertion of hairpins in the ear. The other perforations were of the class known as indirect, as by blows on the ear, and various forms of concussion. The percentage of occurrence of traumatic perforations of the membrane is from one to two per cent. of all ear cases. In some instances a fracture of the skull, chiefly from above downward, is directly continued upon the membrana. In one case the perforation was caused by diving. "Boxing the ear" was the cause of the vast majority. In the legal consideration of these latter cases there are two points to be borne in mind: first, "whether in the absence of simulation the hearing has been injured permanently—for life or for a long period of time; and secondly, whether an ear so injured by a blow had been previously healthy."

The author doubts whether it is the diseased membrana tympani only which is ruptured by a box on the ear. It is not easy to judge of the state of the membrana before the injury in any case. Ears which hear well will often show a membrana abnormal in appearance.

It is also believed by the author that the sound-perceiving portion of the ear can be simultaneously affected in most cases of rupture of the membrana tympani.

The rupture in the membrane generally heals in from three days to six weeks, according to the experience of Treitel. The cicatrix may remain visible for seven months, as in one of the cases reported, though this appears very exceptional. As a rule, no cicatrix remains visible.

In regard to treatment the author very justly says: "The chief rule is to do no harm. A trivial injury to the membrana tympani unskilfully treated may become the starting-point of a chronic middle-ear suppuration, with all its disagreeable consequences. The *best* treatment is simply to close the meatus with a wad of absorbent cotton, and to avoid all use of the syringe." And he might have added: avoid the use of anything in the ear thus injured. The author advises against forcing air through the Eustachian tubes after a traumatic rupture has occurred. If the ear is carefully stopped with cotton —antiseptic preferred—the patient may attend to his affairs if there is no other complication to forbid it.

OPHTHALMOLOGY.

UNDER THE CHARGE OF

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ISOLATED BILATERAL PTOSIS.

PROF. FUCHS, of Vienna, in an interesting paper bearing the above title has described a form of ptosis which he considers represents a different group from cases hitherto known. He met with five cases in all, two in his own practice and three from the practice of colleagues in Vienna. The five cases all occurred in women and are divided into two groups which in some respects differ from each other. In the first group, including three cases, the patients were beyond middle age. They had not at any time suffered from syphilis or any affection of the muscular or nervous system. The movements of the eyes were free in all directions and the pupils normal. In fact, the ptosis constituted the only demonstrable anomaly and the condition did not exist, or had not existed, in any relative, so that there was a complete absence of heredity. The ptosis had developed so slowly that the patients were unable to say when it had begun, but it had not existed in earlier life. Eventually it became so complete that no action of the levator was possible. This condition led to constant wrinkling of the forehead.

There was great thinning of the lids and retraction into the orbit owing to atrophy of the orbital tissues.

The other two cases differed in this way that in both some slight degree of ptosis had existed from birth, and had since developed more completely. In them there was also an hereditary tendency to ptosis which, however, was not very strong in either case. They constituted, therefore, as it were, a transition from the congenital to the acquired ptosis.

In discussing the probable nature of these cases of ptosis, Fuchs points out first, that there could be no question of a paresis of the sympathetic or of a trauma. They must either be due to paralysis of the nerve-fibres supplying the levators or to changes in the muscles themselves. It is certainly rare, though it may occur, that a true nerve paralysis is confined to the levators alone, but there are good reasons for not considering the group of cases described to be due to paralysis. First, because if peripheral there would not be ptosis alone.

Again it is difficult to imagine that they could be central as there is no known centre for the two levators and a bilateral nuclear paralysis confined to the levator nuclei, even supposing distinct nuclei to exist for their muscles, would be extremely unlikely.

On the other hand, it is well established that in cases of congenital ptosis there may be an absence or defective development of the muscles. Fuchs indeed considers his cases to be cases of *atrophy of the levators* for the following reasons: (1) On account of the very slow access of the ptosis, there being even after years some slight yet undoubted contractility of the muscle remaining before all power is lost. (2) Because of the co-existing atrophy of the other parts of the lid, and lastly because some cases are preceded by a slight congenital drooping.

A portion of muscle removed from one case during the performance of an operation for raising the lid (Pana's operation) provided an opportunity of making a microscopical examination; the result of this, however, did not admit of a conclusion as to whether the primary atrophy of the muscles was neuropathic or myopathic in its origin.—*Graefe's Archiv.* xxxvi. 1.

NEW TREATMENT OF SYMPATHETIC OPHTHALMITIS.

DR. ABADIE, of Paris, partly from theoretical considerations suggested by the now very generally accepted view that sympathetic ophthalmitis is microorganismal in its nature, and partly owing to the success which he claims has attended the practice where it has been tried, recommends the following treatment in cases of threatened or actual sympathetic mischief. In the first place enucleation, formerly so freely resorted to, should, in his opinion, be reserved for very exceptional cases in which the injury to the eye has been so severe as to leave no possibility of any vision being restored. Even in cases of very serious injury, in which, notwithstanding the adoption of antiseptic precautions, a sympathetic ophthalmitis has resulted, Dr. Abadie, before proceeding to enucleation, recommends the use of the actual cautery applied freely to the wound, followed by the injection of one or two drops of a solution of corrosive sublimate (1 : 1000) into the eye. In this way he has succeeded frequently not only in checking the sympathetic inflammation, but in improving the state of the exciting eye as well.

Finally, in cases where, in spite of everything, *i, e.*, treatment without or by enucleation, the second eye continues to become disorganized, he recommends attempts at hastening the quieting of the process of inflammation by injecting the same solution into the eye before performing any operation. —*Annales d'Oculistique*, April, 1890.

PUPILLARY CHANGES DEPENDENT UPON TUBERCULAR DISEASE OF THE LUNGS.

RAMPOLDI has on several occasions since 1885 published cases of transitory or persistent mydriasis caused, as he believed, by irritation of the sympathetic in connection with pulmonary disease. Such cases have also been described by Comini, who found the mydriasis most frequent on the right side. In his latest communication Rampoldi refers to a case in which he has been able to demonstrate the causal connection by post-mortem examination. In that case there was double myosis, recognized as paralytic owing to the imperfect dilatation of the pupils under atropine. Both inferior cervical ganglia of the sympathetic nerve were found to be diseased. On the right side this was evident to the naked eye, on the left it was first apparent after hardening and microscopic examination.—*Annali di Ottalmologia*, xix. 2.

THE FORM AND SIZE OF THE INTERVAGINAL SPACE OF THE OPTIC NERVE IN THE REGION OF THE CANALIS OPTICUS.

PFISTER (*Graefe's Archiv.*, xxxvi. 1) has recently investigated this point, which is of interest in connection with the relation between brain and eye diseases, and possibly, also, in connection with sympathetic ophthalmitis. The investigation was made under the guidance of Prof. Haab, of Zurich. The portion of the nerve lying in the optic canal was specially chosen, as not only has that portion received little attention, but the statements in regard to it are conflicting. As regards the method of examination: in the first place suitable portions were removed with the saw from specimens which had been left in Müller's fluid for two years. The decalcification, which lasted from two to five weeks, was then effected by means of lactic acid. The acid was afterward removed by forty-eight hours' treatment with running water, and the hardening finally completed in alcohol. The preparations were rendered transparent by being placed in warm aniline oil (40° C.) for six hours. They were then transferred to xylol at the same temperature, the xylol being frequently changed until it ceased to become brown. Finally, they were cut in paraffin and colored in various ways. The result of the examination of specimens treated in this manner was to show, that both in form and extent, the intervaginal space in the optic canal is subject to considerable individual differences. There is always, it appears, a considerable space between the dural and pial sheath. In some it extends right round the nerve, although there are always pretty strong fibrous tissue filaments passing between the two surfaces. In others, again, the two surfaces are at parts completely grown together. This is most frequently the case below in the neighborhood of the superior ophthalmic artery. The dural sheath is very strongly developed throughout and is specially so below.

Visual Disturbances due to Malaria.

Sulzer (*Klin. Monatsbl. f. Augen.*, July, 1890) has made an exhaustive study of the affections causing disturbances of vision which are more or less directly referable to malarial poisoning. He divides them into two categories. The first includes the cases connected with a malarial cachexy. The second embraces those characteristic of the acute febrile attacks. In the first are: Chronic optic neuritis, leading, the bad cases, to melanosis of the papilla; diffuse infiltration of the vitreous; hæmorrhagic extravasation in the peripheral portions of the retina (these, according to Poncet, are always met with in individuals dying from malarial cachexy); sudden and incurable blindness, due, probably, to cortical hæmorrhages or embolisms. In the second category are: 1. Periodic amblyopia without any ophthalmoscopic changes. The degree of the amblyopia is variable, but in some cases may amount to complete amaurosis lasting for several days, and yet followed by complete recovery on using quinine. 2. Venous hyperæmia of the papilla and retina. 3. Large hæmorrhages in the neighborhood of the papilla and macula.

Tenonitis following Influenza.

Fuchs (*Wien. klin. Wochenschrift*, 1890, 11) observed four cases of idiopathic tenonitis during the influenza epidemic. One reason for believing in the influenza as the direct cause of the inflammation was that three of the cases were met with within a fortnight, whilst Fuchs had only once previously come across a similar case. In two of the cases a more definite confirmation of the diagnosis was afforded by the discovery of pneumococci (Fränkel-Weichselbaum) in cultivations made from the secretion. One case went on to suppuration.

DISEASES OF THE LARYNX AND CONTIGUOUS STRUCTURES.

UNDER THE CHARGE OF

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Epithelial Sarcoma of the Nasal Passages Invading the Frontal Lobes of the Brain.

M. G. Durante reports (*Arch. de Lar. de Rhin.*, etc., June, 1890) an instructive case which exemplifies the necessity of caution and of precaution in attacking suspicious intra-nasal morbid growths.

A man, sixty years of age, came to Dr. Luc's clinic for what he supposed was a simple nasal polyp. The right passage was seen to be occluded by an immobile, fungous grayish mass, which bled readily. Apart from the interference with respiration, and slight debility in consequence of recurrent epistaxes, a tendency to cephalalgia and some tendency to being dazzled, the patient had appeared perfectly well, expressed himself freely, and presented no indication of intellectual trouble.

Recognizing a malignant tumor inoperable without external access, Dr. Luc sent the patient to the *Hôpital Laënnec,* where, in the view of the absence of cerebral symptoms, it was proposed to operate the next day. As the patient arose in the morning, he tottered over and fell dead. The autopsy, twenty-fours hours later, revealed at the base of the cranium a grayish, puriform, and malodorous grumous mass covering the entire space comprised between the anterior portion of the cribriform plate of the ethmoid bone and the wings of the sphenoid. The cribriform plate was perforated and destroyed on both sides; and so was the body of the sphenoid, the destruction being more complete on the right side than on the left. The bones were represented by a semi-liquid puriform clot, through which the canulated sound penetrated into a vast anfractuous cavity formed of the nasal fossæ and the ethmoidal, sphenoidal, and maxillary sinuses largely opened by destruction of their walls. From this orifice a portion of the tumor was removed as an irregularly-lobulated grayish neoplasm, almost completely softened and diffluent in some places, and of fleshy consistence in others, but readily reduced to grumous masses by digital pressure. The dura mater and pia mater of the anterior region of the base of the brain were destroyed. All that portion of the base of the brain comprising the inferior face of the two frontal lobes, the anterior perforated spaces, and the chiasm of the optic nerves, was bathed in this same puriform matter, and showed, after being washed with a jet of water, that it was invaded by the neoplasm. The right olfactory nerve was completely destroyed, and but a number of shreds of the left remained, imbedded in pus and false membranes. The chiasm also was covered and invaded by the false membranes, and softened to such an extent as to make it difficult to understand how sight had been preserved. The inferior portion of the first frontal convolution, the beak of the corpus callosum, and the gray layer of the optic nerves had disappeared; and in their stead was a cavity, the dimensions of a small egg, occupying the two frontal lobes. This cavity was filled with a gray-brownish, grumous, purulent liquid, of an infectious odor. The walls were covered with a corrugated grayish membrane with fine green punctations. The cavity was entirely within the frontal lobes, and was separated from the convexity by a thickness of cortical substance, varying from one centimetre to one centimetre and a half. Behind and below it was separated from the lateral ventricles by a very thin layer of nerve substance which broke through on opening the brain. The ventricles contained but a few drops of liquid, and their walls absolutely healthy, were not even injected. The optic layer and the striated bodies were healthy, and in fact there were no other morbid conditions in the brain.

The tumor, on microscopic examination a sarco-epithelioma, had destroyed the superior walls of the nasal cavities, and had progressively invaded the frontal lobes, where it had produced an abscess, possibly in consequence of the secondary penetration of septic elements, but more probably in consequence of softening and disintegration of its central portions.

Clinically, the observation is curious in view of the latence of cerebral symptoms, which were not suggestive of any invasion of the encephalon. It shows, too, once more, the prudence requisite in undertaking extirpation of nasal growths, for there was no serious contra-indication in this instance, and yet, in all probability, sudden death would have ensued during an operation.

It is interesting, too, as a fresh example of the tolerance of the brain, and particularly of the frontal lobes, to lesions which should apparently have determined death, or at least grave nervous symptoms long before they had reached the extent they had undergone.

In concluding, the remark is made that, as both frontal lobes were equally affected, there could be no assumption that the unknown functions of one side had been here supplemented by an intact homologous region of the other side.

A NEW METHOD OF NASAL IRRIGATION.

PINS, of Vienna (*Mercredi Médical*, April 20, 1890; *Rev. de Lar.*, etc., August 15, 1890) uses a small Wolfe bottle, to the longer tube of which a mouthpiece is attached by rubber tubing, while a nozzle is similarly attached to the short tube. The patient blows the liquid into one of his nasal passages, and, as the forced expiration occludes the rhinopharynx, the liquid escapes by the other nostril.

POSTERIOR HYPERTROPHIES OF THE TURBINATES.

DR. HARRISON ALLEN, of Philadelphia, in an excellent clinical article (*University Med. Mag.*, August, 1890), enforced by a number of briefly narrated cases in illustration, shows that direct surgical interference is by no means always necessary. When the anterior end of an inferior turbinate body is small and well located above the floor of the passage, he finds it much better to apply astringents or caustics to the free inferior border, which is apt to impinge upon the floor of the passage, or to operate with the view of increasing the diameters of the nasal passages by resecting the triangular cartilage and drilling away superfluous projections from the septum; plans which in his hands have been quite successful in reducing the bulk of the posterior masses.

He urges care to avoid mistaking for posterior hypertrophies a normal condition due to a congenital defect of the vomer, which he has termed *recedent.* Thus, when the vomer unites with the floor of the nose at the region of the maxillo-palatine suture, the posterior ends of the turbinals will approach each other, and even come into contact from absence of the septum which would have kept them apart, so that they appear to be protruding into the free space of the rhinopharynx.

Several instances are narrated in which treatment of concomitant pathological conditions succeeded in curing, or greatly relieving, catarrh and asthma without any topical treatment of the posterior hypertrophies; complete relief ensuing in some of the cases even without any diminution of bulk in the posterior hypertrophies. In other cases the posterior swellings diminished or disappeared.

Dr. Allen concludes that it is a good rule to suspend treatment of posterior hypertrophies until all other morbid conditions have been carefully corrected, when, indeed, it may be found, as in three of the instances cited, that they will not require treatment at all.

EMPYEMA OF THE SPHENOIDAL SINUS.

DR. ALBERT RUAULT reports in detail (*Arch. de Lar., de Rhin.*, etc., June, 1890) an interesting case of empyema of the sphenoidal sinus apparently consecutive to rather rough manipulations in extracting nasal polyp with forceps. It was cured after trephining the sinus through the nasal passage, and prolonged antiseptic syringings. Four years later the patient came under observation with a slight empyema of the maxillary sinus, which was cured by extracting a molar tooth, penetrating the sinus, inserting a permanent canula, and antiseptic injections. This is claimed to have been the second case diagnosed, operated on, and cured; the first one having been by SCHAEFFER. Subsequently HERYNG reported four successful cases in his own practice, and E. BERGER has written on the subject, citing RUAULT's case, which he had seen in the clinic, and cases communicated to him by QUÉNN, TROUSSEAU, and MOURS.

OZÆNA.

In an historical and bacteriological research on the nature of ozæna (*Arch. de Lar., de Rhin.*, April, 1890), DR. S. MARANO, of Naples, reviews antecedent opinions and researches and then details the result of his own careful investigations and experiments of control. He finds constantly a special form of microbe, *rhinobacillus*, which is not encountered in any other form of nasal disease, nor, to the best of his knowledge, in any other disease. It is capsulated but is entirely distinct from other encapsulated microörganisms studied by many other observers. It diminishes in abundance proportionately with the institution and efficacy of antiseptic treatment. It is the same micrococcus as has been described by LOEWENBERG, whose failure to find it encapsulated must have been due to defective technique in preparation. Its etiology has not been determined. The article is accompanied with a copious bibliographic index and a number of illustrations from the microscope.

HYPERPLASIA OF THE THYMUS GLAND.

DRS. KRUSE and COHEN report (*Deutsche med. Wochenschr.*, May 22, 1890) a case of sudden death of a boy two years of age, during tracheotomy for diphtheria, and due to hyperplasia of the thymus gland. The gland measured 71 mm. in length, 42 mm. in breadth, and up to 17 mm. in thickness. A tongue-shaped lobe, 25 mm. in length, reached above the upper end of the sternum nearly as far as the isthmus of the thyroid gland. The distance between the spine and the sternum measured only 21 mm. The gland compressed the trachea and both primary bronchi.

MENSTRUAL INFLUENCE ON LARYNGEAL DISEASE.

M. BAYER has reported (*Journ. de Méd. de Chir. et de Pharm.*, June 5, 1890) the case of a woman, twenty-three years of age, with tuberculosis of the right lung, in whose tuberculous larynx œdema of the arytenoid region took place at many menstrual periods. After an arrest of two years' duration, the condition recurred; so acutely at one period as to demand tracheotomy. Œdema recurred at the subsequent menstrual epoch, and in association with a bronchitis which terminated fatally.

DERMATOLOGY.

UNDER THE CHARGE OF
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PRURIGO INFANTUM; PSORIASIS-ECZEMA; PRIMARY PIGMENTED SARCOMA OF THE SKIN; XERODERMA PIGMENTOSUM; DERMATITIS HERPETIFORMIS.

Under the caption "Remarks on various diseases of the skin," STEPHEN MACKENZIE (*Brit. Med. Journ.*, January 4, 1890) calls attention to the above diseases in a brief and practical manner. "Prurigo infantum," of the author, is the affection described by many English writers as "lichen urticatus," which usually begins in early life, often persists, and disappears gradually as the child gets older. Mackenzie is of the opinion that where it persists it becomes what is known as Hebra's prurigo. In the majority of cases local treatment only is valuable, the usual antipruritic remedies being recommended.

A case partaking of the symptoms of both psoriasis and eczema is given, at one time resembling psoriasis, at another moist eczema, the condition being known as eczematous psoriasis. The ordinary treatment for psoriasis was not appropriate, the remedies useful in eczema proving more beneficial.

An example of primary pigmented sarcoma of the skin, occurring in a man aged forty-five, corresponding very definitely to Kaposi's type of the disease, is recorded. The disease shows preference for the hands and feet, and is characterized by firm or hard tumors, or fungating or ulcerating masses of a bluish color. It occurs chiefly in the laboring classes, especially in those subjected to fatigue and hardship. A few cases have recovered under the use of arsenic, especially when given subcutaneously.

Xeroderma pigmentosum, a rare disease, is characterized by pigmentary spots like freckles, mainly on the face, neck, forearms, and hands, beginning in early life, later atrophic spots and telangiectases appear, and eventually warts, excrescences, and fungating growths, which are epitheliomatous or papillomatous. No treatment has proved successful in arresting the process.

Two cases of dermatitis herpetiformis are recorded, both in men aged about forty. In one patient the disease was of a severe type, and had persisted for four years, showing the greatest variety of manifestations. Arsenic exercised the most influence, but fell short of curing the disease.

ON THE NATURE AND TREATMENT OF ECZEMA.

UNNA believes (*British Journal of Dermatology*, August, 1890) in the specific nature of eczema, the essential cause of which is the inoculation of a germ. This germ is doubtless of vegetable nature, and increases and proliferates in the epidermic structures only, requiring probably a condition of the skin suitable for its reception and development. All predisposing factors —"pre-existing improvements of the nutrient base"—hitherto so called, bear upon the disease only in so far as they bring about changes in the skin favorable to the germ-proliferation. External agencies—the so-named exciting factors—are to be looked upon as "accidental improvements of the nutrient base." In accordance with these ideas Unna defines eczema as "a chronic parasitic catarrh of the skin, with desquamation, itching, and the disposition to respond to irritation by exudation, and well-marked inflammation."

The author states that the local treatment should, therefore, always have in view the destruction of every single germ in the depths of the epidermis.

ELFCTROLYSIS IN THE TREATMENT OF LUPUS VULGARIS.

JACKSON has employed electrolysis, somewhat after the method of Gärtner and Lustgarten, in six cases of lupus vulgaris (*Journal of Cutaneous and Genito-urinary Diseases*, November, 1890). The effect while slow was favorable, and in a few instances practically curative. All the cases were of the non-ulcerative type. A metallic electrode of zinc, half an inch in diameter, attached to the negative pole, is placed upon the patch, and the positive electrode (a sponge electrode) is placed indifferently. The strength of current was about seven milliampères, and it was passed for seven or eight minutes. A crust forms, which falls off in a week or so. An application is made once weekly. After a time the disease has so far disappeared that but a few isolated nodules remain. The needle is now substituted for the metallic plate, using a current of about three milliampères. The main objection to this method, the writer states, is that it is slow, otherwise it has many advantages.

NOTES ON PILOCARPINE IN DERMATOLOGY.

KLOTZ gives (*Journal of Cutaneous and Genito-urinary Diseases*, November, 1890) a succinct *résumé* of the literature of pilocarpine bearing upon its employment in cutaneous disease. According to the investigations of such observers as Simon, Pick, Piffard, and others, this remedy has a positive value in such diseases as prurigo, dermatitis exfoliativa, hyperidrosis pedum, pruritus, ichthyosis, etc. Klotz reports favorable results in two cases ot pruritus senilis, from doses of one-eighth to one-twelfth of a grain, t. d., the quantity being gradually reduced. The notes of three cases of eczema, of the papular and squamous type, are also given, showing good effects from the administration of this drug. The author believes that in the light of more recent theories (Unna) of the physiology of the secretion of sweat, the use of pilocarpine in pachydermatous and xerodermatous conditions of the skin has a rational foundation, but as recommended by Pick, it should be given in small doses and be long continued.

THE USE OF THIOL IN SKIN DISEASES.

SCHWIMMER reports (*Wiener klinische Wochenschrift*, No. 18, 1890) favorable results from the external use of thiol in herpes zoster, dermatitis herpetiformis, erythema multiforme, papular eczema, etc. Reference is made to an unusually rebellious case of dermatitis herpetiformis, which responded rapidly to applications of a lotion of thiol (1 : 3); the lotion was painted over the affected parts twice daily for several days, and then the skin washed with water. The vesicles and bullæ disappeared, leaving slight pigmentation. Powdered thiol (thiolum siccum pulverisatum) seemed preferable in erythema multiforme, whereas in papular eczema the wash was more cleanly and satisfactory. The remedy has the great advantage of absence of disagreeable odor.

OBSTETRICS.

UNDER THE CHARGE OF

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The Pathology of Tubal Pregnancy in its Early Months.

Orthman (*Zeitschrift für Geburtshülfe und Gynäkologie*, Band xx. Heft 1) concludes from the study of ten cases of tubal pregnancy operated upon between the first and second months, that a firmly-organized clot found upon laparotomy in an oviduct is very strong presumptive evidence of the occurrence of tubal gestation. An intra-peritoneal hæmatocele with tubal pregnancy results from rupture of the sac of the embryo, or through an abortion of an ovum situated at the abdominal opening of the tube. The recognition of decidual cells is not absolutely necessary for the diagnosis of a tubal pregnancy. Villi of the chorion can be recognized in all cases of tubal pregnancy during the early months.

Pernicious Vomiting in Pregnancy.

Flaischlen (*Ibid.*) reports five cases of pernicious vomiting in pregnancy, of which three perished. In two cases, induced abortion resulted in prompt relief to the patient, while two of the fatal cases were lost in spite of this resource. Flaischlen believes that, as a rule, the uterus is emptied much too late in these cases. He regards a very rapid pulse as the most important indication of danger, and would base his decision regarding the necessity for interference largely upon this symptom.

The Influence of Methods of Examination and Conduction of Labor upon Puerperal Mortality.

Leopold and Pantzer (*Archiv für Gynäkologie*, Band xxxviii. Heft 2) have studied the problem of the relation of puerperal mortality with methods of conducting labor and making examinations. It was found that many cases of infection arising after normal labor were occasioned by neglect of antiseptic precautions after labor. It was not sufficient that strenuous care be exercised during delivery, but every precaution must be taken to keep the patient clean during her lying-in period. It was found, however, that the best results were obtained by omitting all injections of antiseptic substances, and confining the attention to the most strenuous external cleanliness and antisepsis. It was also observed that in proportion as internal examinations were omitted, that mortality and morbidity diminished. It was seldom necessary in normal cases to make any further examination than such as can be made by palpation and auscultation at the commencemen of labor and a systematic observation of the behavior of the uterus during labor. The drift of these studies is distinctly in the line of non-interference and restriction of examinations to palpation and auscultation.

Menstruation and Pregnancy after the Removal of Both Ovaries.

Robertson (*Ibid.*) reports a case in which both ovaries were removed for the relief of chronic pain and disability. Three months after the operation the patient menstruated normally, subsequently married, and was delivered of a large male child about eighteen months after the ovaries had been removed. (The most rational explanation of this case is that a portion of the ovarian stroma was left behind by the surgeon at his operation.)

Repeated Tubal Gestation; Operation; Recovery.

Herman (*Ibid.*) reports the case of a patient from whom he had removed the right tube for ruptured tubal gestation, who came under his observation with a similar condition upon the left side of the uterus. When exposed, the tube was seen as a purplish-red ovoidal swelling at the side of the uterus, its long axis parallel with that of the uterus, and connected with it by soft adhesions. It was removed without subsequent drainage. The patient's recovery was complicated by nausea and vomiting, which took place after her first operation. She made a perfect recovery in a month after operation.

Modern Methods of Treating Lingering Labor.

A discussion before the British Medical Association will be found reported in the *British Medical Journal*, No. 1552, 1890, upon this subject. Playfair prefers chloral in doses of fifteen grains repeated in twenty minutes to allay the pains of the first stage of labor. A third dose is rarely required, and the drug may be given by enema if the stomach be irritable. When uterine contractions are deficient, quinine is often of service during the first stage. It is occasionally justifiable to separate the membranes, should they be attached round the internal os, by the introduction of the finger. When the anterior lip of the cervix is prolapsed and impacted between the head and the pubes, it is well to push it up between the pains by the finger. For delay in the second stage of labor, expression of the fœtus by pressure upon the uterus is often justifiable. The physician should stand beside the patient, who is placed upon her left side, and with his left hand upon the fundus of the uterus he should press strongly downward in the axis of the brim. The use of the forceps is often avoided by this manœuvre. Regarding the use of the forceps, the attitude of the practitioner should be one of constant watchfulness as labor progresses. When it is evident that the mother's powers are exhausted, delay should instantly cease, and the use of instruments be chosen.

In discussion upon this subject, the general drift of opinion was that during the first stage of labor the hot vaginal douche, the use of a narcotic to remove the inhibitory action of pain, and such assistance as change of posture would afford were all considered advisable. During the second stage, the cautious use of instruments was urged.

THE PROGNOSIS OF LABOR AND THE PUERPERAL CONDITION IN OLD PRIMIPARÆ UNDER ANTISEPTIC PRECAUTIONS.

ERDMANN (*Archiv für Gynäkologie*, Band xxxix. Heft 1) concludes from an extensive study of labor in old primiparæ that there is no definite limit, so far as age goes, by which to determine that a patient is, or is not, to be considered as an old primipara. It depends upon individual characteristics and not upon any especial age in month or years. At twenty-seven, the characteristics which are of practical importance in these cases are already present. The number of illegitimate births bears no relation to the age of the mother.

In the case of old primiparæ it is found that menstruation is usually deranged, producing a condition of anæmia and constitutional weakness. Such patients have, therefore, as a rule, a weaker constitution than young primiparæ. Contracted pelves are more frequent in these cases. Œdema and pernicious vomiting are not especially frequent. Eclampsia increases in frequency with a patient's age. Abnormal presentations and positions are also more common, especially breech presentations. The duration of labor increases in these patients, and inefficient labor-pains are common. Obstetric operations are more frequent and bear a close relation to the size of the pelvis, the rigidity of the soft parts, and the vigor of the pains. The mortality of the mothers in labor, when old primiparæ, has been reduced by the introduction of antiseptics to the usual rate. The procedure of incising the cervix and the walls of the birth-canal has resulted in lowering the mortality among children in these cases.

Thirty-six per cent. of all abortions in primiparæ are caused by syphilis, and 23 per cent. of all children perishing after the age of viability also die from syphilis. Uterine involution is slower in proportion with the patient's age. Febrile affections during the puerperal period are not more frequent with these patients than with others, a result obtained by the use of antiseptic precautions in labor.

THE TRANSMISSION OF THE BACILLI OF TYPHOID FROM MOTHER TO FŒTUS.

GIGLIO (*Centralblatt für Gynäkologie*, No. 46, 1890) contributes an interesting and thorough report of the examination of a fœtus and appendages in a case of typhoid fever occurring at Palermo. The expulsion of the fœtus occurred forty-six days after the beginning of the fever. The fœtus and placenta seemed absolutely normal. Upon macroscopic examination, no pathological condition was discovered; microscopic examination of the blood was also negative. Bacterial culture of the maternal blood resulted in the production of a bacillus, cultures of which bore the marks of those of typhoid fever. When these cultures were compared with those made directly from typhoid material, it was found that both germinated after twenty-four hours, and that after four days points of difference in minute particulars could be detected, although the general resemblance was striking. Cultures made from the milk showed the presence of bacteria exactly resembling those obtained from a typhoid case not complicated by pregnancy. Upon potato, comparative culture-tests established the identity of the case in question with typhoid. A bacteriological examination of the fœtus and its appendages resulted in identifying bacilli found in the fœtus with the bacilli described by Eberth as indicating typhoid. The case is especially interesting from the thorough manner in which it has been studied, and the positive results obtained.

The Indications for the Induction of Labor.

At the recent International Congress Parvin (*Archiv für Gynäkologie*, Band xxxix. Heft 1) describes the indications for the induction of labor as, first, incoercible vomiting. In ten cases which he has collected which were so treated, in eight the mother recovered, and five living children were born. The mortality-rate was inconsiderable.

Other indications for the induction of labor were, diseases of the kidneys, heart disease, capillary bronchitis, pneumonia, œdema, and phthisis. In ten cases of phthisis, in six the mother recovered. In affections of the nervous system, namely, eclampsia, and meningitis, six cases out of nine recovered after the induction of labor. The most frequent indication, however, was abnormality of the pelvis; out of 988 cases of induction of labor, 870 were performed for this cause.

The Operative Treatment of Eclampsia.

Halbertsma (*Ibid.*) has collected ten cases of eclampsia treated by Cæsarean section. Two of these cases perished, or 20 per cent. The average mortality, under treatment by narcotics and warm baths, in twenty cases, was 17 per cent. for the mothers and 77 for the children. Halbertsma urges in cases of eclampsia occurring at term, treatment by baths and narcotics until labor can go on. In cases where labor begins but is delayed, he would incise the cervix deeply, and deliver the patient. In severe cases, where some time must elapse before labor can occur, he would perform the Cæsarean operation. He would not allow a patient to perish undelivered.

The Prognosis of Pregnancy Complicated by Tumors.

Gordes (*Centralblatt für Gynäkologie*, No. 45, 1890) gives an interesting account of sixteen cases of pregnancy complicated by abdominal tumors. In four, abortion followed, and removal by surgical treatment. In four, pregnancy was ended by amputation of the uterus, and once by Cæsarean section. Out of sixteen cases, four perished.

GYNECOLOGY.

UNDER THE CHARGE OF

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Etiology and Pathology of Fibro-myoma.

Engström (*Med. Anzeiger zur Centralblatt für Gyn.*, Aug. 1890) calls attention to the fact that heredity seems to play some part in the etiology of fibrous growths of the uterus (as shown by an analysis of the histories of several families in which he had observed that two or more sisters suffered from them), as had been previously pointed out by Winckel, Carl Braun, and Gusserow—a fact which seemed to prove Cohnheim's theory of their embryonal development.

Boisleux (*Ibid.*) examined ten specimens of fibroid uteri removed *in toto* by Martin, with special reference to the detection of microörganisms in the cervical endometrium. Sections were made through that portion of the cervix which usually forms the stump after supra-vaginal amputation. In four cases he found micrococci which produced rich cultures on gelatine plates, and caused death in mice and guinea-pigs which were inoculated with them.

The Treatment of Ovarian Cysts by Faradism.

Noeggerath (*Ibid.*) reports six cases which were treated in this way from six to eight weeks, the tumor diminishing visibly in every instance and even disappearing entirely after a longer interval had elapsed. Proliferous multilocular cysts of moderate size are best suited for this treatment. The negative pole of the secondary current is introduced into the vagina (a sponge electrode being used), while the positive pole is attached to a large sponge electrode, which is placed on the abdomen. A current is used which is barely felt by the patient. Three *séances*, of half an hour each, are held weekly.

Vuillet's Method of Dilating the Uterus.

Vuillet (*Ibid.*) claims the following advantages for his method: Dilatation may be carried so far that the interior of the uterus may be inspected, and it may be maintained as long as desired. Perfect drainage is secured, the endometrium is rendered directly accessible to local treatment, and morbid growths are more readily removed through the dilated cervix, while intra-uterine hæmorrhage is most effectively treated by tamponing the cavity after previous dilatation.

Extirpation of the Bladder in the Female.

Pawlik (*Ibid.*) reports the following interesting case: The patient applied to his clinic on account of persistent hæmaturia. By catheterizing both ureters hæmorrhage from the kidney was excluded. Digital exploration of the bladder revealed the presence of a polypus the size of an almond, which was removed per vaginam through an incision, its base being thoroughly cauterized. The patient was discharged cured. A year later she returned, extremely anæmic, stating that after enjoying good health for eight months the hæmaturia returned and had never ceased. Through the endoscope a diffuse papillomatous growth was seen, portions of which were removed for microscopical examination and proved to be malignant. The writer determined to extirpate the entire bladder, after turning the ureters into the vagina, in order to form a new bladder from the latter and the remains of the urethra. The preliminary operation was performed by inserting metallic catheters into both ureters (the patient being in the knee-elbow posture), incising the vagina opposite to the terminal extremity of each ureter, dissecting out the duct, and then ligating and dividing it two-fifths of an inch from its opening into the bladder. The cut end of each ureter was then stitched into the corresponding vaginal wound after removing the catheter; after healing had occurred there were thus formed two uretero-vaginal fistulæ. Three weeks later the radical operation was performed. An incision was made as for suprapubic lithotomy, the peritoneum was dissected from the bladder, and the latter was separated from its attachments as low down as the urethral opening, the organ having been previously distended with an iodoform emulsion in order to render it more prominent. At this stage the bladder was emptied and the cavity already made was packed with iodoform gauze on account of the oozing. The anterior vaginal wall was now incised just above the most prominent part of the urethro-vaginal septum, the bladder was drawn down through the wound and was cut away at the vesical orifice of the urethra. Here the patient collapsed, but was revived by the subcutaneous injection of ten ounces of warm salt solution, and the operation proceeded. The anterior vaginal wall was sutured to the anterior border of the urethral wound, the posterior border being united to a freshened surface at the entrance of the vagina in such a way as to produce a kolpokleisis. Before the sutures were tied elastic catheters were introduced into the urethra and carried into the ureters. The abdominal wound was closed, except at its lower end, through which were carried the ends of the gauze for drainage. The patient made a good recovery, but a fistula remained which communicated with the cavity that had formerly been occupied by the bladder, which did not heal for eight months. A second unsuccessful attempt at kolpokleisis was made ten months after the primary operation. This was repeated a month later, the anterior and posterior walls being united transversely; a minute fistula remained behind the urethra, through which urine escaped only when the patient was in an erect posture. She was able to retain control of her artificial bladder until twelve ounces of urine had accumulated, when she could empty it by contracting the perineal muscles. The woman made a perfect recovery and was able to undertake a journey from Prague to Berlin and to spend several days in sight-seeing.

[This remarkable case is certainly a triumph of plastic gynecological surgery, before which others sink into insignificance. The practical application of Professor Pawlik's long and patient experiments in catheterization of the ureters proves that this manœuvre is something more than a scientific pastime. The boldness of the conception and the untiring patience of the operator awaken our highest admiration.—Ed.]

Iritis Catamenialis.

Trousseau (*Archives de Tocologie*, No. 6, 1890) reports the following case: A patient, æt. thirty-five, had menstruated normally until three years before, when she was attacked with iritis in the left eye, which developed two or three days before a monthly period and disappeared with the cessation of the flow. There was no suspicion of syphilis. An oculist diagnosticated irido-choroiditis with hypopyon, and, learning that she previously had rheumatism, prescribed salicylate of sodium. From this time on the patient had a return of the trouble at every period, sometimes a day or two preceding, but usually immediately before the flow—on two occasions *after* it. When examined by the writer the left eye was injected, the iris slightly clouded, and the vitreous turbid, containing small flocculi. The lower fifth of the anterior chamber was filled with pus, which disappeared with slight movements of the head. There was no pain or photophobia. On dilating the pupil with atropine synechiæ were noted. The patient stated that the trouble had been absent during the first eight months of a recent pregnancy, so that she supposed that she was cured, but that it had reappeared during the ninth month at the time when menstruation would have occurred. In five days, under the use of atropine, the hypopyon was absorbed and the eye presented its normal appearance. She had an easy accouchement and menstruated once without a return of the iritis, but before her next period the hypopyon reappeared. On this occasion Trousseau punctured the cornea and withdrew pus, which was subjected to a careful bacteriological examination, that showed it to be laudable as regarded septic qualities. The patient was placed on naphthol and quinine, with vaginal injections of carbolic acid. The following month a transient cloudiness of the iris was noted two days before the period, which quickly disappeared spontaneously, but with the next menstruation the attack was just as severe as before, and was repeated every month thereafter in spite of continued anti rheumatic treatment. The writer, after careful observation, was led to believe that the irido-choroiditis was of infectious origin, the seat of infection being within the uterus, and regretted that he had not made a bacteriological examination of the menstrual discharge, with the view of determining if it contained any septic element which was present only during the period. The fact that the ocular trouble was absent at the first menstruation after delivery would seem to support this hypothesis. Cohn has reported similar cases which occurred during the puerperium.

Prolapse of the Urethral Mucous Membrane in Young Girls.

Benicke (*Zeitschrift für Geburtshülfe und Gynäkologie*, Band xix. Heft 2) calls attention to this rare affection, of which he has seen three cases. Munzer published a paper on this subject, in which he referred to twenty-one cases, ten of the patients being between six and fifteen years of age. The diagnosis of the condition, as distinguished from a neoplasm, turns upon the cylindrical or funnel-shaped form of the mass which protrudes from the meatus. The symptoms are sometimes so slight that their cause might be easily overlooked. In the writer's three cases his attention was called to it, not by painful or difficult micturition, but by hæmorrhage during the act. The prolapsed mucosa was sensitive in two of the cases.

The etiology of this affection is somewhat obscure. The patients are usually of delicate constitution, and may or may not have had previous catarrh or irritation of the urethra, perhaps from oxyuria. Masturbation should be taken into account. Persistent cough, as during pertussis, is a possible etiological factor.

In one case, in which the prolapse was less marked, the patient was cured by an application of the cautery. In another an equally favorable result was obtained by replacing the prolapsed mucosa, and narrowing the urethra temporarily with sutures until the redundant tissue was reduced by repeated cauterization. If this does not succeed, the simplest plan is to excise the prolapsed mass and to suture the raw edges with catgut.

The Electrical Treatment of Cancer of the Uterus.

Wernitz (*Berliner klin. Wochenschrift*, September 22, 1890) limits this treatment to cases that are nearly, or quite, inoperable. A large, flat electrode being placed over the abdomen, and a ball electrode applied through a speculum directly to the diseased surface, a current varying from one to two hundred milliampères is passed for not longer than ten minutes; a *séance* is held daily or every other day. In some cases the growth is punctured with a platinum needle attached to the negative pole. When the positive pole is used a thin grayish slough appears at the point of contact, which separates within twenty-four hours, leaving a clean raw surface, that has less tendency to bleed; with the negative pole there is no visible slough, but a secretion of fluid.

Four cases are reported at length, in which the electrical treatment caused entire cessation of the pain, so that opium could be dispensed with, and marked improvement in the appetite and general condition. Sloughing and foul discharge ceased. The action of the current in these cases is probably two-fold, a local or chemical, whereby healthy granulation and cicatrization are promoted, and an electrolytic, in consequence of which there is a molecular disintegration and absorption of the cancer-cells in the deeper tissues.

PÆDIATRICS.

UNDER THE CHARGE OF

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A. F. CURRIER, M.D., OF NEW YORK, AND W. A. EDWARDS, M.D., OF SAN DIEGO, CAL.

The Buccal Phenomena and Complications of Measles in Children.

Cauvet (*Gaz. Méd. de Paris*, May 31, 1890) claims that during measles there may be two varieties of lesions of the mouth, one being due to the infection of the disease, the other being a superadded complication. The phenomena due to the infection of measles are of two kinds: 1st. Buccal erythema, which is usually present at the same time as the nasal catarrh, and consists in a red spottiness, or a simple redness upon the tongue. It may be followed by desquamation of the tongue. 2d. Follicular stomatitis, due to glandular hyper-secretion with obstruction of the excretory canal, and coinciding ordinarily with the miliary eruption of the skin. These phenomena may be due to the poison of the disease, which is eliminated by the glands. The oral complications which are superadded to measles may vary in nature and gravity, and may show the following forms:

1. Muguet, which is the most frequent complication.
2. Aphthæ upon the tongue, the lips, or the internal aspect of the cheek.
3. Ulcerative stomatitis, which may follow rupture of the aphthæ, or may result from infection which has been superadded.
4. Diphtheria, which, as has been shown by Roux and Yersin, may develop whenever there is epithelial desquamation. There is frequently a lingual desquamation following buccal erythema. In other conditions, aside from measles, diphtheria is unlikely first to attack the tongue.
5. Gangrene of the mouth, which is a severe though rare complication.

To avoid these accidents antiseptic washes should be freely used for the buccal cavity. A saturated solution of boric acid will be found very serviceable for this purpose. The washes should be used from the very beginning of the disease, when there may be only a mild degree of erythematous stomatitis. These complications are much more common in hospitals than in private practice, and this is fortunate, for in hospitals they are much more likely to receive the attention that is required.

CROUPOUS PNEUMONIA IN CHILDREN AND ITS TREATMENT.

COPASSO (*Arch. Ital. di Ped.*, 1890) states that between the first week and the sixth year of life children are very susceptible to this disease. Those are especially predisposed to the disease in whom the thorax is undeveloped relatively to other parts of the body. Cutaneous erythema upon the trunk is one of the first symptoms, especially in severe cases, and is probably due to obstruction to the flow of blood toward the thoracic cavity. To the vascular obstruction are also due the albuminuria of the disease, the congestion of the liver, the spleen, and the brain, the softness of the tissues offering no opposition to the dilatation of the capillaries. In cerebral pneumonia the morbid process is usually limited to the left apex, while there is also œdema of the pia mater. The posterior portion of the lung is more decidedly affected than the lateral or inferior portions. Cardiac weakness may follow the disease, and the pulmonary vesicles very slowly resume their original form and volume. Caseation and tuberculization of the exudate in such young patients are rare, and so also are induration, suppuration, and gangrene. It is believed by the author that the theory of the infectious origin of the disease is a correct one. Salicine may not be given with safety at this period of life. Leeches may be used with advantage to the painful portions of the chest. Excitants of the nervous system and the heart, including red wine and quinine, also expectorants, may be prescribed.

SYDENHAM'S CHOREA, ITS ETIOLOGY AND CHARACTER.

LEROUX (*Rev. Mens. des Mal. de l'Enf.*, June, 1890) states that the period of development of this disease is from the eighth to the twelfth year, which is also the period of the so-called growing-pains, and frequently of rheumatism. From eleven to twelve—that is, in the pre-menstrual period, girls are more subject to chorea than boys, and it is also the period in which anæmia is very common. In 1888 the author saw 487 cases of anæmia, 395 in girls and 92 in boys. Between the ages of eleven and twelve one sees the largest number of cases of chorea, anæmia, and growing-pains, and in addition many cases of articular rheumatism. The question is raised whether one of these diseases will provoke the other and whether chorea is of a rheumatic nature. A rheumatic chorea has been described, but cases are so numerous in which chorea is evolved independently of rheumatism, that the possibility of a necessary relationship between the two diseases is questionable. Anæmia, infectious diseases, rapid growth, etc., predispose to chorea, but they also predispose to rheumatism. The author agrees with the opinion of Jouffray and Saric, that chorea is a cerebro-spinal neurosis of evolution—a neurosis of growth.

THE OPERATIVE TREATMENT OF CHRONIC HYDROCEPHALUS.

POTT (*Jahrb. f. K.*, xxxi. 1, 2) claims that there are no difficulties which are technically insuperable in operations for chronic hydrocephalus. Not all cases of this condition are suitable for operation, and it is well to consider the probable results in favorable cases, especially in view of the fact that the results heretofore have not been very encouraging. All cases in which the intracranial effusion is extensive must be let alone, also congenital cases in which a rudimentary development of the brain is suspected, such cases being complicated with spina bifida or other serious lesion. In those in which, in spite of the hydrocephalus, the children are psychically and physically well developed, or at least were so before the enlargement of the cranium, an operation may be considered. Such children usually deteriorate slowly but steadily as the result of cerebral irritation or pressure. Any operative procedure in such cases will be the less dreaded when one realizes the gloomy prognosis if relief is not attempted. Such children become imbecile or idiotic; they do not learn to talk, or quickly lose whatever they may have learned. If the pressure continues total blindness will almost certainly result. In an advanced condition of hydrocephalus complicated movements of coördination, including walking, standing, or sitting, may be impossible. If walking is acquired the gait will be wavering and uncertain. Pareses, contractures, partial and general clonic spasms are ordinary occurrences. All these symptoms are more or less conditioned upon the accumulation of the ventricular fluid and the increase of endocranial tension. The circulation in the cranial cavity is weakened and retarded by the pressure and may be stopped. Functional disturbance will follow, and then pathological changes in the brain-substance. If the pressure is removed by arrest of the secretion and ossification of the cranium, restoration to health, to a certain extent, is possible. Most of those who recover suffer with atrophy of the brain and remain idiots for life. In a case which was operated upon by the author great improvement followed each withdrawal of the fluid. The comatose condition passed away, the pupils reacted to light, the pulse became fuller and stronger, the breathing regular, and the desire for food returned. The entire condition of the patient was satisfactory until the appearance of pus in the cerebro-spinal fluid removed the hopes of success which had been experienced. If in any given case suppuration could be avoided, incision and drainage would furnish better prospects of success than any other plan of treatment which has been suggested.

PUBLIC HEALTH.

UNDER THE CHARGE OF

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THE MICROBE OF MALARIA.

DR. F. PLEHN, in the *Zeitschrift für Hygiene*, Bd. viii., H. 1, 1890, gives an account of some researches of his in this subject, and a history of the opinions entertained by others during the last twelve years.

In 1879 Klebs and Tommasi-Crudeli described a bacillus found by them in the water and soil of the Roman Campagna, which they were led by certain experiments to look on as the microbe concerned in the causation of malarial fevers.

In 1880 Laveran found in the blood of a subject of malaria in Algiers an organism, not present in that of healthy persons, which he called *Plasmodium*, and maintained to be the essential agent of the disease, in opposition to Klebs and Tommasi-Crudeli.

Ziehls in 1882, and von Sehlens in 1884, discovered bacilli and cocci in the blood of malarial persons in Italy, but made no experiments. Previously to 1880 Koch's method of pure culture was unknown, and though Klebs and Tommasi-Crudeli had never found the bacilli in the blood of patients, the transfusions of Dochmann, Gerhardt, Cuboni, Golgi, and Marchiafava were considered to be conclusive. But the Nestor of bacteriologists, Fred. Cohn, has since deprived the bacillus of all claims to a pathogenic character, Klebs himself has at last disowned his fondling, and Marchiafava and others have gone over to the other side.

Laveran's conclusions have been supported and vindicated by the observations and experiments of Marchiafava, Celli, and Colgi in Italy, Metschnikof, Czenzinski, and Sacharof in Russia, Sternberg, Councilman, and Osler in America, and of Laveran himself in Corsica, Tonkin, Madagascar, and Senegal, whose combined experience has established its claims almost beyond question, though Dujardin, Pfeiffer, Rosenstein, and Hoffmann have alleged that the *plasmodium* is present in the blood in other febrile conditions, as typhoid, scarlatina, and vaccinia, and that it is, therefore, to be looked on rather as a modification of some of the normal elements.

Fischer, of Kiel, examined the blood of eighty subjects of malaria from the Cameroons, West Indies, etc., and Schellong that of a large number of patients in New Guinea, and, since his return to Germany, of cases of recurrent attacks, with none but negative results. It must, however, be borne in mind that the value of negative evidence is at a minimum when the object of the search is new, and only to be detected by special methods of examination and staining demanding much technical skill and practice.

Dr. Plehn, after nine months' preparation as assistant in the Hygienic Institute at the University of Jena, began his observations at the Moabit Hospital in Berlin, on three cases of typical intermittent fever in which the several stages were well marked, the temperature reaching a maximum of 41° C. (105.8° F.) and respectively of the quartan, tertian, and quotidian forms—the last, however, subsequently passing into the tertian. The two former, from Hamburg and Posen, gave negative results, but he was successful in the case of the last, a laborer from Potsdam, who had suffered for two months from severe quotidian ague, for which he had had no medical treatment, having been refused admission to the hospital there from want of room. It is worthy of notice that after this man had been treated with large doses of quinine, and the quotidian had been succeeded by the tertian form, the plasmodia rapidly decreased in numbers and soon disappeared entirely. This may account for the failure of many observers, to say nothing of the paucity of material at the disposal of most compared with the opportunities enjoyed by Italian physicians, among whom Celli and Guarnieri, for instance, have treated as many as 2000 patients in one summer.

In the Potsdam case Plehn found the plasmodia in abundance in all stages of the disease, but especially during the febrile exacerbations. Only the smaller were colorless, the larger being pigmented by granules and rods of melanin irregularly disposed. For the details of his manipulation we must refer to his paper.

In a postscript he states that since going to press he has also found the plasmodia in great numbers in the blood of a recurrent case returned from Sumatra, and that he intended continuing his observations on every opportunity.—*Zeitsch. f. Hyg.*, 1890.

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LIFE-SAVING METHODS IN STILLBIRTHS.

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A few weeks ago I was called in consultation to the bedside of a young primipara in advanced labor. I found upon examination that the child's head was low in the pelvis, and that the cervix was very nearly dilated. The pains seemed good, but for the past two hours there had been no progress of the presenting part. The extraction of the head by means of forceps was a simple task, but after its birth it was found that the advance of the shoulders was arrested by the cord, which was short and drawn tightly around the neck. The cord was, therefore, divided with scissors, and the child was rapidly extracted. It had reached the pallid stage of asphyxia. All respiratory action was suspended, and the heart-pulsations had apparently ceased.

The child was placed upon the table and wrapped in warm cloths. The mucus was expelled from the posterior fauces and from the nasal passages by mouth insufflation. A No. 8 English gum catheter was then passed into the trachea, and the aspirated mucus was removed by suction. The quantity of mucus in the bronchial tubes was large, and the catheter had to be introduced many times. After preliminary clearing of the trachea and bronchial tubes, direct insufflation was practised. In ten minutes slight heart movements were observed, but these ceased when insufflation was suspended. A little later the child gasped from time to time, usually it seemed in response to the irritation of the catheter when introduced into the trachea. An hour's perseverance in this plan of treatment was rewarded by the appearance of a little color upon the surface of the child. The latter was then immersed in warm water, and when lifted from the bath a stream of spirits was poured from a height upon the epigastrium. No respiratory movements were excited. Schultze swinging-movements were next resorted to, and were followed by Sylvester's method; but in employing the latter it was found necessary to draw the tongue forward and to depress the base to secure a passage for the entrance of air into the lungs. It was, however, nearly three hours, spent in the use of warm baths, cold sprinklings to the surface, and in the alternating resort to Schultze's and Sylvester's methods, before spontaneous respiratory movements were finally established. The next day the child had repeated attacks of tetanus, but these finally grew infrequent, and after twenty-four hours ceased altogether. The child is now robust and healthy, and the joy of a worshipping household.

I grant this story is a familiar one, and yet the incident has stimulated me to treat of the subject of life-saving methods in stillbirths. I do this the more earnestly because I believe the attitude of the profession in general is one of incredulity as regards the efficacy of the means at our disposal to restore the life of children in the more desperate cases of asphyxia. In my experience it is the usual procedure to spank the child, to immerse it in hot and cold water, and then to wrap it in warm cloths and place it by the fire to die. Yet the object of medical practice is to save life, and for my part I regard the rescuing of a newborn infant from impending death to be as distinctly a professional triumph as the saving of life by ovariotomy, by Cæsarean section, or by the operation for appendicitis.

To do effective work it is necessary for the physician to make himself familiar with the physiological conditions which occasion the first respiratory act, and the secondary pathological changes which result from suspended animation. For the mechanical resources employed to restore the circulation, and to excite spontaneous respiratory movements, should not be selected by divining-rod methods, but should be natural sequences of our knowledge of the disturbed conditions calling for relief.

It is, of course, well known that during the period of gestation the child remains in a state of apnœa, and that the respiratory function necessary to its development is performed by the placenta. So soon, however, as the child is born, in normal cases, the thorax expands, the diaphragm contracts, and pulmonary respiration is established. The premature establishment of pulmonary respiration while the child is still in the utero-genital passage, owing to the absence of an atmospheric medium, is followed by asphyxia, and is the usual cause of stillbirths.

The reason of the first respiratory movement in the child, whether prior or subsequent to its birth, has long been a subject for speculation. Omitting earlier views, at present two theories contend for supremacy. The one formulated by Schwartz maintains that in all cases the respiratory act is due to disturbed placental circulation, and the consequent lack of oxygen in the blood of the child. Preyer, on the other hand, insists that respiration is a reflex movement provoked by cutaneous stimuli. He admits, however, that a venous condition of the blood favors the action of external stimuli by increasing the irritability of the respiratory centres.

As a contribution to the solution of the questions in dispute, Otto Engstrom[1] has recently reported a series of experiments made by him upon gravid rabbits and guinea-pigs, in Preyer's laboratory. The animals were strapped to a board, and were then immersed in a saline solution (six per cent.), which was kept at blood-heat by a special apparatus. The head of the animal was placed above the fluid. A small incision was then made in the abdominal wall, through which a uterine cornu was allowed to escape into the saline fluid. The uterine walls were next opened opposite the mesenteric attachment at the point of least vascularity. As there was no hemorrhage to stain the saline fluid, it was possible to observe the fœtuses through the membranes in the clear amniotic fluid. When this experiment was performed with address and dexterity, the exposed fœtus remained in a state of apnœa, and the blood in the umbilical vein possessed a bright-red color, in marked contrast with the dark hue of the blood in the umbilical arteries.

If now the cord was compressed through the membranes by the thumb and index-finger of the warmed hand, or by self-closing compressing forceps applied to the cord near to the placenta, and as far from the fœtus as possible, respiration followed in from three to six seconds, and continued until death supervened from asphyxia. The same results followed when the umbilical vein was pricked with a needle, or was divided by scissors. Again, in other cases, to avoid the criticism that external stimuli were not absolutely excluded by the manipulations employed, the mother was asphyxiated by carbonic acid gas, or poisoned by woorari, or bled to death by opening the carotid. Here, too, soon after the blood in the umbilical vein became of a venous hue, respirations occurred as heretofore, though all manipulations were carefully avoided. It is, therefore, demonstrated that fœtal respirations are excited, in the absence of external sources of irritation, so soon as the blood in the umbilical veins becomes darkened, or is cut off from the fœtus.

On the other hand, in another series of cases, where the amniotic sac was exposed under a blood-warm saline fluid, and the apnœa was not disturbed, Engstrom gently pricked the extremities of the fœtus with a needle. Reflex movements were excited, but the apnœa continued. When, however, deep puncture was made, the alæ nasi dilated, the mouth opened, and thoracic inspiration was evoked. The effect was, however, momentary, and the apnœa returned.

Again, in order to reduce the disturbance of the placental circulation to a minimum, Engstrom, following a method invented by Preyer, seized the head of a fœtus with the thumb and index-finger through the abdominal walls, and then cut through the abdominal coverings, the uterine walls, and amniotic sac to the nose of the animal. The nose was then lifted above the saline fluid and exposed to the atmosphere. By means of powerful currents of induced galvanism applied to the nasal organ, respiratory movements were excited, but ceased when the current was removed. It seemed doubtful, however, whether inspiratory acts did occur in either series of experiments, so long as the placental circulation was completely undisturbed. The existence of apnœa in the fœtus is not conclusive evidence that the opening of the uterus, or the compression of the uterine walls produces no derangement in the blood-currents of the placenta. The results were often negative at the beginning of the experiment, but as the blood in the umbilical vein darkened, the electric and mechanical irritants produced more and more marked effects.

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[1] Ueber die Ursache der ersten Athem bewegungen.

From these experiments it becomes evident that when the placental respiration is suspended the accumulation of unknown materials in the blood is capable of exciting the respiratory centre in the medulla oblongata of the fœtus without the aid of peripheral stimuli; but that the latter are capable of exciting the respiratory act before the internal stimuli have increased sufficiently to induce independent action. Again, it is a familiar fact that in moderate degrees of asphyxia in the newborn, after the irritability of the medulla has been lowered to a point at which no response follows from the venous condition of the blood, external stimuli are still capable of exciting respiratory movements.

Engstrom found, too, that when the fœtus had breathed in the amniotic sac, after respirations had ceased, and after the blood in the umbilical vein and arteries had become of the same blue color, and the nose and lips had become cyanotic, it was still possible to excite respirations in some cases by opening the amnion and lifting the head so as to expose it to the air, and in others by pinching the nostrils, the ears, and the mouth.

I shall hardly need to apologize for endeavoring to recall to the memory of my readers the peculiarities of the fœtal circulation. The arterialized blood in the umbilical vein empties partly into the portal vein and is first distributed to the liver, and in part passes by the ductus venosus into the inferior vena cava. The mingled venous and arterial currents then enter the right auricle, and are in early pregnancy directed by the Eustachian valve across the right auricle to the left auricle, and thence pass to the left ventricle. As the heart contracts the blood is driven from the left ventricle to the aorta, and is thence distributed by the large vessels which spring from the latter to the head and upper extremities. The blood returned from the upper portion of the body by the superior vena cava, enters the right auricle, where it passes in front of the Eustachian valve to the right ventricle. With the advance of gestation, however, a gradual disappearance of the Eustachian valve takes place, so that a part of the blood from the inferior cava enters with that of the superior cava into the right ventricle. The contraction of the right ventricle forces the blood into the pulmonary artery, which distributes an insignificant quantity to the lungs, while the main current passes through the ductus arteriosus to the aorta, by which it is distributed to the lower portion of the body. Now, though the greater part of the regenerated placental blood is distributed to the head and upper part of the body, it is mingled largely with venous blood returning from other organs, and that which goes to the respiratory centre in the medulla oblongata is of a character which would cause dyspnœic manifestations in self-breathing individuals.

During labor, especially in the last stage, the placental aëration of the blood is interfered with by the uterine contractions, and in its passage through the pelvis the surface of the child is subjected to pressure and friction. At birth the body is exposed to the air. These combined causes as a rule are followed by pulmonary respiration, though in some instances of lowered irritability of the medulla, prolonged apnœa follows the birth unless the child is made to cry by vigorous slapping.

As the chest expands in the act of inspiration the lungs fill with air, and the blood from the pulmonary artery pours into the opened pulmonary vessels. The pressure in all the vessels of the body is diminished, though in the thorax a partial compensation takes place from the aspiration of blood from the veins which enter the intra-thoracic space. The diminution of pressure is greatest in the pulmonary artery. The current which empties into the aorta becomes of feeble force, and finally ceases altogether. The ductus arteriosus gradually closes, and the pulmonary circuit becomes complete. The withdrawal of the blood from the pulmonary artery, and the force of aspiration, lower the tension in the aorta. The heart beats more slowly. The resulting diminished arterial pressure is most felt in the extremities. The pulsation of the umbilical arteries as a consequence ceases, and the placental circulation is suspended.

In the asphyxia of newborn infants the suspended animation is, with few exceptions, preceded by intra-uterine respirations. The causes of the latter are to be found in tetanic contractions of the uterus and the consequent diminished blood-supply to the placenta, in premature detachment of the placenta, in compression of the cord, and in the sudden death of the mother. Of these the compression of the cord is by far the most common.

The first effect of the compression of the cord is to arrest the circulation in the umbilical arteries. The pressure in the aorta is thereby augmented, and increased work is thrown upon the left ventricle of the heart. Except in cases where the mouth and nasal passages are closed by pressure, with the expansion of the chest, due to the irritation of the medulla by the increased venosity of the blood, amniotic fluid, meconium, and mucus are aspirated into the air-passages. When the compression of the cord is temporary the circulation may be restored, and the apnœa may again return; but in cases where the respirations continue, the capillaries of the lungs fill with blood from the pulmonary artery, the intrathoracic venous congestion is increased, and the heart action is lowered. As the irritability of the medulla sinks, the respirations fail, the cavities of the heart fill with venous blood, the lungs are congested, and in some instances sub-pulmonary ecchymoses result from over-distention of the pulmonary vessels. Outside the thoracic cavity, the venous trunks are often distended with blood. This secondary venous stasis is most marked in the vessels of the neck, head, and brain, but to a less degree venous stases are likewise observed in the abdominal organs and in the capillaries of the skin.

After the birth of the child the prognosis is dependent upon the degree of asphyxia. In the milder cases the muscular tonus is preserved, the head does not drop, the extremities are not relaxed, the skin is dusky-red or cyanotic, the conjunctivæ are injected, the umbilical vessels are distended, and the cardiac and umbilical pulsations are slow but forcible. Reflex movements are easily produced by surface irritation. In these cases spontaneous respiratory movements often occur.

In the more advanced stage, the muscular tonus is lost, the head falls to one side, the sphincters are relaxed, the eyes are glazed, reflex movements cannot be provoked, the heart-beats are feeble and infrequent, the umbilical vessels are nearly empty, and the pulse scarcely perceptible. The cutaneous circulation has disappeared, and the surface is pale and cold.

If respirations occur, they are feeble and are not associated with movements of the muscles of the face. The first signs of returning animation are the refilling of the cutaneous capillaries and the restoration of the muscular tonicity. In fatal cases the pulmonary vessels are found to be widely distended, the lungs are heavy and of a dark-red color, and pulmonary, subpleural, subpericardial, and subendocardial ecchymoses are present. The obstruction of the pulmonary circulation further produces congestion of the abdominal viscera and of the brain.

The indications for treatment are in all cases to clear out the air-passages, to restore the irritability of the medulla, to increase the force of the heart contractions, and to relieve the plethora of the heart and of the blood-channels of the thorax.

In cases where the muscular tonus is preserved these indications are, as a rule, easily fulfilled; aspirated fluids and mucus should be cleared from the fauces with the finger. If the nasal passages are obstructed, mouth-to-mouth insufflation should be employed. The child should be made to cry by flagellation, and the respiratory movements should be further stimulated by alternately immersing the child in hot and cold water. So far the procedure is a familiar one, but in a good number of cases we know that in a few days the skin becomes dusky, the heart action feeble, and the child has been temporarily restored to life only in the end to die of atelectasis. As a means of guarding against this fatal sequence, due in part to imperfect expansion of the lungs, in part to lobular congestion, there is no method that rivals the one of Schultze.

Schultze directs that the child should be grasped in such a manner that the operator's thumbs rest, on either side, upon the anterior thoracic wall, while the index-finger occupies the axilla, and the remaining fingers are placed diagonally across the back. The child is then allowed to hang at arm's length between the knees of the obstetrician, its face being turned to the front. In this position the pectoral muscles are made to draw the superior ribs upward, the abdominal muscles draw the inferior ribs downward, and the weight of the liver causes the descent of the diaphragm. By this means the capacity of the chest is increased and inspiration is produced. The child is next swung upward, until the arms of the operator reach an almost horizontal position. The swinging motion is then arrested, flexion occurs in the child's lumbar spinal region, its head is directed downward, and its lower extremities fall slowly toward the obstetrician until the whole weight of its body rests upon his thumbs. In this way the chest and abdomen are powerfully compressed, the diaphragm is forced upward, and an efficient expiration results, and any retained adventitious matters are expelled from the air-passages. An inspiration is now produced by reversing the direction of the swing and returning the child to its former position of complete extension, by which manœuvre the chest is made to expand and the diaphragm to descend. .

By this method not only is good aëration of the lungs secured, but the forcible expiration expels the materials aspirated from the bronchial tubes. A still more important action, according to Schultze, is the relief of the overloaded vessels as a result of the compression of the entire thoracic contents. Thus, as expiration is produced by the upward swing the blood is pressed from the left ventricle into the aorta, and from the right auricle into the right ventricle. The emptying of the left ventricle makes room for the contents of the left auricle and permits the return current from the pulmonary veins. From the right ventricle the surplus blood finds a passage into the aorta through the ductus arteriosus. With the inspiratory swing blood is aspirated from the peripheral vessels into the blood-channels of the thorax. The aspirated blood is, however, venous, as the semilunar valves prevent regurgitation from the aorta. By alternating the expiratory and inspiratory swinging movements the pump-working of the heart is mechanically set in action. As the blood-streams pass through the heart cavities the systo'e increases in force and the arterial tension is restored.

In cases of deep asphyxia, in which muscular tonicity is lost, and the heart movements are scarcely perceptible, the methods at first employed should involve the minimum degree of disturbance to the child. Active movements are, as a rule, speedily followed by the extinction of heart pulsations.

The child should be laid upon a table and covered warmly. After clearing the fauces and nasal passages a No. 8 English elastic catheter should be passed under the guidance of the fingers of the left hand through the larynx into the trachea, and aspirated matters should be carefully removed by suction. This often requires time and the repeated introduction of the tube. Meantime, at intervals, insufflations through the tube into the bronchial tubes should be employed. After each insufflation the chest walls should be compressed with the hand to produce expiration. By this means, little by little, the blood receives oxygen, and the returning irritability of the medulla is manifested by occasional spontaneous respiratory movements. Then the Sylvester's method, which Champneys has shown is followed by the fullest expansion of the air-cells, is of service. Only, to secure favorable results it is often necessary to draw the tongue well forward. So soon as the heart movements become plainly perceptible the child should be placed in warm water, and sprinklings of cold water upon the face should be practised. Finally, the swinging method of Schultze should be employed to complete the establishment of the normal circulation.

But in these cases of deep asphyxia no miracles are to be wrought without patience, watchfulness, and a hopeful spirit. Often, when a certain amount of progress has been obtained, the heart action begins to die out, and we find ourselves obliged to go back to the catheter and insufflations anew. There is, however, no greater joy to the physician than that which comes from watching the gradual restoration to life of a young child, and to know that the life has been saved by the intelligence and the knowledge which God has given to us.

OBSTRUCTIVE DISEASE OF THE LOWER EXTREMITY OF THE ILEUM.

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I have entitled my paper "On Obstructive Disease of the Lower Extremity of the Ileum," for, although in their morbid anatomy, the cases I propose to narrate differed importantly among themselves, the fundamental clinical fact in each was the existence of obstruction in the situation indicated, and the symptoms which the patients presented were identical, and collectively distinctive of the mechanical character and site of this lesion. Each case, no doubt, presents some special point or points of interest which give it individuality, and to which I shall call attention; but I am afraid I must acknowledge that their general effect is not so much to teach anything actually new, as to afford a striking and impressive confirmation of facts with which most of us may be supposed to be fairly familiar. Clinically they may be considered to correspond to the cases to which Dr. Hilton Fagge, many years ago, applied the term "contraction of the small intestine."

It will be most convenient to give a brief narrative of each of my cases, making a few comments in the course or at the close of each; and to conclude with some remarks suggested by the cases collectively.

Case I. *Obstructive disease of the lower part of the ileum, due to adhesions.*—Keziah P., aged seventeen years, was admitted some years ago into St. Thomas's Hospital under the care of my obstetrical colleague.

She was said to have had typhoid fever at twelve years of age; at any rate she seemed to have had at that time some serious disease, attended with abdominal symptoms which had laid her up for three months. While suffering thus, a tumor had been discovered in the lower part of the abdomen on the right side, just above Poupart's ligament. Since her convalescence from this illness she had on the whole enjoyed fairly good health, but the tumor had never disappeared, and she had been liable to attacks of colic. The tumor had not varied in size, but had sometimes been tender to pressure, and occasionally after much exertion, or maybe without any obvious cause, she had experienced aching pain in or about its situation. The colicky attacks had come on quite irregularly, sometimes pretty frequently, at other times intermitting for several weeks, usually attended with vomiting, and often lasting off and on for two or three days at a time. The bowels were said to have been regular.

During the last few months her symptoms had become more severe, the tumor had not increased in size or become more tender than it had been, but the attacks of colic had grown in frequency, the abdomen had enlarged, she had suffered much from sickness, and she had become emaciated and weak.

She was admitted into my colleague's ward in the belief, I presume, that her symptoms were due to some affection of the reproductive organs. But, in consultation with myself, this view was discarded, and on the twelfth of December she was transferred to one of my beds.

She was a bright, attractive-looking girl, but very thin and weak. She complained of severe colicky pains, coming on frequently night and day, and lasting from a few seconds to a minute or two at a time; of distention of the abdomen; of frequent sickness; and of loss of appetite. There were no indications of intra-thoracic disease, beyond some displacement of the heart and lungs upward, and some undue dulness of the lower part of the chest behind. The abdomen was much distended, and, on observing it during her paroxysms of pain, dilated coils of bowel could be seen to rise into prominence all over its surface, to present undulatory movements, and then, with a gurgling sound, gradually to resume their quiescent state. The pain was evidently very severe while it lasted. There was an obvious tumor, roughly speaking, about the size of a hen's egg, in the centre of the right ileum, and immediately over the middle part of Poupart's ligament. It was neither hard nor dull on percussion, but was just such a tumor as might have resulted from some old inflammatory thickening about the cæcum. There was no abdominal tenderness, and in the intervals between the paroxysms, the belly, though considerably enlarged, and presenting superficial indications of dilated bowels, was soft and flaccid. There was no enlargement of liver or spleen. She was sick once or twice a day, the vomit consisting for the most part of the ordinary contents of the stomach. Her bowels were regular, sometimes indeed opened two or three times a day; the motions being somewhat fluid, of a bright yellow-ochre, and very offensive. The temperature was normal.

She remained under my care for about a fortnight, during which period her condition gradually but decidedly deteriorated; the attacks of colic and violent peristalsis (although the pain attending them was relieved to some extent by opiates) continued without abatement; she was frequently sick, and could take little or no food; her evacuations, for the first few days, were fairly regular and of the character above described: but during the last eight days the bowels were obstinately confined. The abdomen, as at first, though distended, was soft and flaccid and free from pain or tenderness in the intervals between the attacks of colic. The tumor continued without change. Her temperature was for the most part normal or subnormal.

Toward the end of the fortnight it had become obvious that unless something could be done to relieve the obstruction which obviously existed somewhere in the neighborhood of the ileo-cæcal valve, or of the lower part of the small intestine, she would speedily sink, not from the effects of actual impermeability of the bowel, but from the pain, sickness, and innutrition which were the chief symptoms of her malady. And on the afternoon of December 26th, I decided to have, as a preliminary palliative measure, the distended bowel punctured in one or two places, in order to allow of the escape of some of the accumulated gaseous contents. I did not care to do the operation myself, as at that time I was not very familiar with it; and at the moment I was unable to obtain the assistance of any one of my surgical colleagues. Just, however, as I was leaving the Hospital to keep an important appointment, I met one of the junior surgical staff, explained the case, as I understood it to him, and asked him to see it with my house-physician, and, if he agreed with me, to perform acupuncture in two or three places.

When I reached the Hospital the next day at two o'clock, I learned that my patient had died in the course of the night and that a post-mortem examination was about to be made on her. I also learned something more, namely, that the surgeon on puncturing the bowel came to the conclusion that he had punctured an abscess-cavity, and, despite the entreaties of the house-physician, had insisted on tying the trocar in, and kept it there for half an hour or more. Acute peritonitis set in even before the trocar was removed and she died of collapse in the course of a few hours.

At the *post-mortem* examination there was discovered general acute peritonitis, without, however, any material effusion of fluid or of lymph. The lump detected during life in the right iliac fossa was found to be due, not to diseased cæcum or ovary, but to a kind of tangle of the lower part of the ileum caused by some old bands of lymph. This tangle began eight-and-twenty inches from the ileo-cæcal valve, and involved about fifteen inches of the bowel above. At the upper limit there was a sudden contraction of the bowel, and this was maintained not only throughout the tangle, but down to the cæcum. The intestines above were largely distended throughout, in some places measuring as much as three and a half inches in diameter. The cæcum and large intestine were of small diameter, and the sigmoid flexure, extending across the abdomen, was adherent to some extent to the mass occupying the right iliac fossa. At about eight feet from the cæcum was a perforation in the smaller bowel, nearly large enough to admit the tip of the little finger; this was surrounded for three-quarters of an inch by lymph discolored with fæcal matter, which had attached its margins to the anterior abdominal wall. Further examination showed that the parietes of the dilated bowel were much thickened, especially immediately above the contracted portion; that the latter was healthy in structure and pervious throughout; that the large intestine was healthy, and that, while the distended portion of the smaller bowel contained a large quantity of thin fæcal matter, there were traces of similar fæcal matter in the contracted bowel and small quantities in the colon. There was nothing to show that the old peritoneal adhesions had any relation to former typhoid or any other ulceration of the bowel.

The bases of the lungs were collapsed and void of air; but the lungs in other respects, and all the other viscera, were healthy.

I assumed, during life, that the patient was suffering from some old disease of the cæcum, to which the tumor in the right iliac region was due; that such disease was the cause of the partial obstruction which had led to the dilatation and hypertrophy of the small intestine, and to its exaggerated and painful action; and that the so-called attack of typhoid fever five years previously had really been an attack of typhlitis. The lump, however, was not cæcum, but an entangled knot of bowel. It is clear she must have had localized peritonitis, probably at the time of the attack above referred to; but what the cause of this peritonitis was must remain in doubt. It seems not improbable, however, that the alleged attack of typhoid fever was really an attack of this disease, and that the peritonitis was a consequence of it. The lamentable misadventure which terminated the poor girl's life furnishes no valid argument against puncture of the bowel judiciously performed in such cases; but it proves that the operation is one likely to be attended with serious results in the absence of reasonable precautions.

CASE II. *Obstructive disease of the lower part of the ileum due to adhesions.*—A very similar case to the above was published by me about three-and-twenty years ago in the eighth volume of the *Pathological Transactions.*

The case was that of a man aged forty years, who had been attacked suddenly with severe colic ten weeks before his death. In the early part of his illness such attacks occurred in bouts of two or three days' duration each, coming on at comparatively long intervals. But during the last month (for three weeks of which time he was under my care) he was suffering from almost constant abdominal pain and tenderness, associated with paroxysms of colic recurring every five or ten minutes; in which the abdomen became distended, and the inflated coils of intestine remarkably distinct. During the paroxysms the progress of the peristaltic movements could be followed with the greatest facility and there was much gurgling. He was thirsty, had no appetite, and frequently vomited stercoraceous fluid. While under observation he passed but little fæcal matter, and this mainly under the influence of enemata; but there was never any proof of complete obstruction. His death was from gradual failure of his vital powers.

At the *post-mortem* examination the small intestine was found for the most part enormously distended, its color heightened, and bands of rather intense capillary congestion extending irregularly along the coils; but there was no effusion of lymph or of fluid. On tracing the small intestine from the duodenum downward, it was found in the condition above described, as far as the middle of the ileum; from which point to within a foot of the cæcum, the coils were adherent to one another and to the brim of the pelvis by congested and readily-lacerable bands and filaments of false membrane. The portions which were adherent were so entangled that it was difficult to unravel and trace them. The greater part of the involved intestine was dilated. The lower part, however, and all that intervened between it and the cæcum, were contracted to the diameter of the tip of the little finger. The cæcum and large intestine were contracted throughout. The mucous membrane was everywhere healthy. The dilated small intestine was loaded with thin, pea-soup-like fluid; but the contracted part (which, however, was quite pervious) was empty. There were a few small, solid fæcal lumps in the ascending colon.

I came to the conclusion at the time that the peritoneal adhesions were the result of an attack of peritonitis occurring at the beginning of the patient's illness; and that the obstruction was due to the embarrassment to the action of the bowels resulting from the contraction of the adhesions external to them.

CASE III. *Obstructive disease of the lower part of the ileum due to cicatricial tissue.*—A. W. H., aged sixty-three years, admitted under my care on February 27, 1888. He first failed in health about twelve months previously, but it was not until last July that he began to suffer from attacks of constipation, attended with much griping pain and vomiting. The attacks of constipation, which came on irregularly, would occasionally, he said, continue for three weeks; and during their continuance he would suffer from a constant gnawing pain in the epigastrium and frequent recurrences of severe griping and vomiting. He has had eight or nine such attacks; of which the last (from which he is still suffering) came on about three weeks ago. He has been rapidly losing strength and flesh lately. He never passed blood by the bowels.

State on admission: Much emaciated and complaining of the symptoms above detailed.

He remained in the hospital until March 12th, exactly a fortnight. During the earlier part of this time attacks of colic, attended with violent peristalsis, came on about every twenty minutes, and lasted each two or three minutes, or more. While thus suffering, the superficial coils of intestine could be seen swelling and moving as though they were a bundle of snakes, the abdomen became distended, and loud borborygmi were heard. When the attack subsided, the abdomen still remained rather full, but was comparatively flaccid and easy to explore. There was no particular tenderness; and no tumor or enlargement of any organ could be detected. He often complained of nausea, but was only sick once. The vomit did not present either sarcinæ or yeast fungus. The bowels were inclined to be constipated; but the motions were generally abundant, semifluid, and of a greenish hue. His urine once or twice presented a trace of albumin; his pulse varied from 60 to 70, and his temperature from 96.2° to 98.4°.

During the last week there was progressive amendment; the colicky attacks diminished in frequency and severity, although never absolutely disappearing; he lost his nausea; and his bowels became fairly regular. The abdomen, however, remained unduly tumid. His temperature continued for the most part subnormal. He did not gain strength.

Feeling better, he left at his own request.

On the 21st (that is, nine days later) he was readmitted. His bowels had not been open for five or six days; and during this period he had been suffering from frequent attacks of colic, and had had much sickness. For three or four days after admission, the bowels still remained obstinately confined, notwithstanding the employment of castor oil and other mild purgatives, and enemata. The condition of things was precisely that previously described. The attacks of colic came on every ten or fifteen minutes or so, and lasted for two or three minutes; the pain was evidently very severe; and during its continuance beads of perspiration would gather on his forehead; coils of intestine swelled up, hardened, and stood out in prominent relief; and there was much gurgling, especially toward the close of the attack. The vomiting was not specially connected with the taking of food, and was mainly of watery mucus more or less stained with bile.

He remained in the hospital for about two months, during which time he steadily got thinner and weaker, but his abdominal symptoms underwent considerable fluctuations. For the most part he suffered from looseness of bowels, the evacuations (excepting that they were semifluid) being normal in quality. Occasionally, for three or four days at a time, he was constipated. The attacks of colic varied in frequency and severity. They never absolutely left him; for periods of two or three days he would suffer comparatively little, and express himself as "doing finely"; but for the most part they were frequent and severe, and attended with all the usual accompaniments. During the time he was under observation there was no obvious relation between them and the presence of either constipation or diarrhœa. His sickness also presented variations. Not infrequently he was free from it for several days; these periods for the most part corresponding to the periods in which colic was in abeyance. Sometimes it occurred frequently; and often he complained of nausea. When fairly free from pain and sickness he had a desire for food and could take it; and this was so almost to the last. The tongue was sometimes coated in the centre, but for the most part was fairly healthy-looking. The abdomen continued unduly large and tense, and was at times (especially when he was suffering from pain) somewhat tender; but there was never any indication of fluid or of tumor. The urine was usually scanty, but of normal specific gravity, and free from sugar and albumin. His pulse, which was weak, ranged from 80 to 88. His temperature was always subnormal, varying from 95° to 97.6°.

On May 25th it was remarked that, although his abdominal symptoms were not, and had not been for a few days, troublesome, he was getting very weak, and that he complained of sore throat and was husky. On the 27th I made a note to the following effect: "The patient does not suffer so much from pain as he did, he has not been sick for some days, and he takes food fairly well; but he gets thinner and weaker, his pulse is barely perceptible, and his hands, feet, and face are cold, livid, and mottled."

After this he passed into a condition of semi-stupor, in which he failed to recognize those about him, refused all food save a little wine, his pulse became imperceptible at the wrist, and his extremities very cold, his internal temperature remaining subnormal. He died a little before noon on the 29th.

Autopsy: An extremely-emaciated man with slight œdema of both feet. On opening the abdominal cavity the intestines were found to be moderately distended. On further examination the large intestine throughout its whole length was found collapsed, and the small dilated down to within two inches of the ileo-cæcal valve. At this point the bowel was evidently narrowed, and cicatricial tissue was seen in its wall. On opening the intestines the larger was found to be healthy in its whole extent as also were the cæcum and its valve. But at the point in the smaller bowel above referred to, the channel was obstructed by an oval, softish mass, about as large as an almond-shell, projecting inward from one side. This projection, though having the form of a growth, occupied the convexity of a kind of kink in the course of the bowel; and, on section, appeared to consist solely of greatly hypertrophied mucous membrane, thickened muscular coat, and a comparatively large core of indurated subperitoneal tissue. No true new-growth was recognized, but it may be added that, where the kink existed, and whence the tumor appeared to spring, the two opposed surfaces of the peritoneal coat were firmly united together by old adhesions. The mucous surface of the small intestine both in the situation of the tumor and elsewhere was perfectly healthy. In the mesentery, occupying the ileo-cæcal angle, and just outside the strictured spot of bowel, a hard oval mass nearly as large as a pigeon's egg was felt. On section this presented a most unusual appearance. The middle part, comprising about a third of the whole sectional area, was a soft reddish mass; the periphery about half an inch thick, consisted of dense fibrous tissue concentrically arranged. It did not present the character of a new-growth, but it seemed probable that it was a disorganized gland which had become surrounded with a capsule of inflammatory origin.

Here and there in the peritoneum old adhesions were found, more especially between the liver and diaphragm, and the whole of the portion of mesentery in the ileo-cæcal angle was thickened and puckered.

All the other abdominal organs were healthy; as also were the nerve-centres. Both lungs were intensely congested in their dependent parts, and dotted with islands of recent broncho-pneumonia. The aortic and mitral valves were thickened, but there was no serious cardiac disease.

The resemblance of this case to that of Keziah P. was in its symptoms so striking that while the patient was still alive I could scarcely avoid regarding it as of the same nature, and I leaned to the belief that (even though no definite lump could be felt) there was an obstruction at the lower end of the ileum, and that that obstruction was due to the entanglement of the bowel by old adhesions. There was old inflammatory mischief, and also there were adhesions; but the obstruction, as has been shown, was due, not to the latter, but to a narrowing of the lower end of the ileum effected partly by the presence of a kind of cicatrix occupying one side of the gut, and partly by a projecting lump caused apparently by thickening of the intestinal walls at that part. Again, the cause of this condition remains doubtful; and there was nothing in the patient's history, as it was elicited from him, to afford a hint toward the solution of the problem. I must confess I am inclined to suspect, in this case as in the other, that the phenomena present were really the sequelæ of a former (and forgotten) attack of typhoid fever. The curious lump discovered in the mesentery in the neighborhood of the obstruction seems to be best explained on the assumption that it was a disorganized gland which had become encapsuled. If such were the case, it enhances the probability of the typhoid fever hypothesis being the true one.

The clinical phenomena of the latter part of the patient's illness point, I conceive, to death, not from obstruction directly, but from innutrition and asthenia.

CASE IV. *Obstruction of lower end of ileum due to malignant disease of the ileo-cæcal valve.*—William R., a plumber's mate, eighteen years of age, was received into one of my wards on the 23d of June, 1890. He had had good health down to the commencement of his present illness, and had been a plumber's mate for three years.

Early in May he had an attack of colicky pain which, starting from the right groin, radiated over the abdomen. After lasting two or three minutes it passed away, only to recur thenceforth at irregular intervals. Diarrhœa accompanied the onset of the pain and lasted three or four days; since when the bowels have been quite regular. A week or two after the beginning of his illness he began to observe that the attacks of pain were attended with swelling of the abdomen, and subsided with a gurgling sound. He has had no sickness or loss of appetite, and has not observed any blood or anything else abnormal in his motions. The bowels have latterly been open two or three times a day. He thinks he has lost flesh.

He is anæmic and emaciated, and complains of paroxysmal attacks of abdominal pain coming on at intervals of ten minutes or so. Each attack is attended with the swelling-up of coils of bowel, generally first observable in the right iliac fossa, but gradually extending over other parts of the abdomen. The convolutions become distinctly mapped out, sink and swell and vary in size and tenseness, until at the end of from twenty to thirty seconds a loud gurgling takes place, apparently in the neighborhood of the umbilicus, the distention subsides and the parts become quiet. During the attack the patient suffers from severe pain, but is almost quite free from tenderness. In the intervals the abdomen, though large and prominent, is flaccid, and admits of ready examination. There is no enlargement of liver or spleen, and no tumor excepting a hard, smooth, painless lump, deeply seated in the right hypochondrium just below the tips of the ninth and tenth ribs. This was described by the house-physician as extending, at the time of admission, for a distance of two inches below the ribs, but I never myself found it extending more than a finger's breadth in this direction, or measuring more than an inch and a half horizontally. No further evidence of disease is detectable, either in the abdomen or in the chest. Tongue clean. There is a red line along the margins of the gums, but no blue discoloration. Urine free from albumin and sugar. Temperature normal.

For twelve days after admission the patient's condition underwent no material change. The abdominal pains and peristaltic movements of the bowels continued to come on every few minutes, although both were kept to some extent in abeyance by opium. The abdomen was generally tense but not markedly tender. The lump which had been recognized on admission remained without obvious change. His appetite was poor and he was occasionally sick. The bowels acted irregularly but sufficiently. The temperature remained subnormal.

On July 5th it was noted for the first time that the abdominal cavity contained fluid. This increased during the next few days and the belly became very tense and somewhat tender. The colicky pains and movements continued, and the latter were still strikingly obvious through the parietes. His tongue got coated; his appetite disappeared; he was still sick from time to time. The bowels became much constipated, and indeed, from about July 5th onward there was no satisfactory action. Yet they were occasionally relieved slightly by enemata or castor oil, and he continued to pass flatus. There was still no rise of temperature. About July 7th a patch of anæsthesia appeared on the front of the right thigh, in the domain of the middle cutaneous nerve, associated with some neuralgic pain, which phenomenon continued.

On the twelfth he was extremely weak and ill. The abdomen was very tense and tender and contained a good deal of fluid. The colicky attacks continued, though they were hardly so severe as they had been. He was scarcely sick, but did not take food. His temperature was still subnormal. He passed flatus but there had been no evacuation for two days. It may be added here that the evacuations had never presented any blood and were for the most part half-formed.

As the bowels were extremely tense it was determined to puncture them to let off some of the flatus. This was done in the afternoon, but only a little gas escaped and no benefit resulted. He died at 10 P. M.

Autopsy: Body much wasted; no *rigor mortis.* The abdomen fairly large but extraordinarily tense. On making an opening into it, turbid yellow fluid spurted to a height of about three feet, clearing the table.

In this way perhaps two or three pints were discharged. On laying the abdomen open, nothing but much distended small intestine was visible, everywhere brightly injected, but showing no evidence of past or present inflammation. On exploring the cavity, a large, hard mass was at once felt in the upper part of the right loin, but was not visible. It lay under cover of the liver and on the anterior surface of the right kidney. On further examination, the mass, which was as large as a man's fist, was found to be due to a growth (originating in the situation of the ileo-cæcal valve, but involving both the ileum and the cæcal walls in the immediate neighborhood), which had passed by intussusception into the ascending colon for a distance of about six inches. The intussusception could not be reduced. The tumor was annular in form, with a narrow channel of about two inches in length, and allowing the passage of the little finger in its axis. Its surface was purple and congested. On section it was hard and white. The portions of the bowel involved in the intussusception were not materially congested. The small intestine, as above stated, was extremely distended, containing some flatus and a large quantity of bright yellow pasty fæces. It was free from ulceration or other disease.

There were numerous enlarged glands in the mesentery and in front of the vertebral column, up to the size of a pigeon's egg. They were very soft and pinkish-white on section. The morbid growths were small round-celled sarcoma.

Of the three punctures made shortly before death all were visible in the abdominal walls; but only one was discovered in the intestine as a minute scratch without any extravasation.

All other organs were healthy.

The symptoms in this case again were so similar to those of the cases that had gone before, that I was compelled to the conclusion that, in it as in them, there was some obstruction in the smaller bowel near the cæcum; and, knowing how common a cause of obstruction adhesions in this situation are, I concluded that there were adhesions. Adhesions, however, are very frequently connected with the presence of peritoneal cancer or tubercle; and the discovery of a lump, apparently having some relation with the liver or the peritoneum in its vicinity, tended to confirm the suspicion that the boy was suffering from one of these affections. The coming on of ascites later, as I thought, settled the question. I acknowledge I never had any suspicion that he was also the subject of intussusception, or that the small lump I recognized during life was the lower end of a much larger mass tucked up under the liver. But I may add that, while I admit that an ileo-cæcal intussusception might, and often does, produce symptoms identical with those exhibited by my cases, I think, as a matter of fact, the intussusception in this instance had no influence over the patient's symptoms or the progress of his case.

The question as to whether the patient's symptoms were due to lead-poisoning was raised several times. I did not acquiesce in that view; nevertheless, for a short time he was treated with iodide of potassium; but, needless to say, without benefit.

CASE V. *Obstruction of lower part of ileum due to malignant disease.*—John H. C., a clerk, aged twenty years, a patient of Dr. James Barbour, was admitted under the care of Mr. Sydney Jones on the 21st of July of the present year, and on the 31st was transferred to mine.

His health had been good down to the previous November, when he was first attacked with severe pain in the umbilical region coming on after taking food. From that time until February the attacks seem to have occurred daily, supervening on every meal, and lasting for an hour or so. In February the quality of the pain altered. It assumed more of a "tearing" character, commencing in the right iliac fossa and thence radiating over the abdomen, and was attended with flatulent distention. Attacks of this kind have continued ever since, coming on irregularly; sometimes in severe paroxysms, sometimes for a week or two together in a mild and bearable form. About the end of March his medical attendant discovered a lump in the cæcal region, which the patient lost after lying up for five or six weeks. In April he became sick; and for the six weeks prior to admission he has suffered from sickness, mainly in the morning, and occurring about once a week on the average. His bowels have been inclined to constipation all along, but have been kept free by the use of enemata. He has gradually failed in strength, and has lost forty-two pounds in weight during the last eight or nine months.

State on admission: Patient is anæmic and emaciated, complaining of pain after food with habitual constipation, and frequent attacks of flatulent colic, followed occasionally by sickness. The abdomen is somewhat resistant and distended. At intervals varying from five to ten minutes, he experiences a sharp pain in the right iliac fossa, accompanied by sudden distention of the bowel in that situation, and subsequently by distention of various coils of small intestine. So dilated do they become that the abdominal wall, moulded to them, reveals by its inequalities and movements the varying state of the parts beneath with remarkable distinctness. This condition having been maintained for about twenty seconds, there follows a loud gurgling sound, with the cessation of which the abdomen becomes quiescent. There is a little pain on pressure and some sense of resistance, but no definite tumor, in the right iliac fossa. No tumor or enlarged organ can be felt anywhere else; and there is no indication of the presence of fluid effusion. The solid organs of the abdomen and the thoracic viscera all appear to be healthy. The urine has a specific gravity of 1022, is acid, and free from albumin. Tongue clean; appetite poor; bowels confined; pulse 80; temperature normal.

On August 5th he was examined under chloroform, and a lump about the size of a tangerine orange was felt deep-seated in the right iliac fossa.

On the 12th, an exploratory operation was performed by Mr. Pitts. The abdominal cavity was opened in the right linea semilunaris. A little clear fluid escaped through the wound; and numerous adhesions between the bowel and adjoining parts were discovered, some of which had to be broken down. The cæcum was fixed and could not be brought into view; but a hard new-growth was felt, apparently involving the wall of this viscus and of the lower part of the small intestine for several inches. It appeared also to extend downward into the upper part of the pelvis. Several of the mesenteric glands were enlarged; and a mass of similarly-enlarged glands occupied the retro-peritoneal tissue. In addition, many small white bodies, the size of rape-seed, studded the peritoneal surface. It was clear that there was disseminated malignant disease of the intestines and peritoneum, and the operation, therefore, was abandoned.

The patient suffered no serious inconvenience from the operation, and the wound soon healed. He is still under treatment, and remains in much the same state as on admission. He has apparently lost flesh somewhat and become weaker; but otherwise there is no marked impairment in his health. A tumor can still be felt, but it has not obviously increased in size. He remains liable to attacks of flatulent colic, which vary in severity, frequency, and duration; are sometimes, even for days together, so slight as to be of little trouble to him, sometimes for hours or days at a time very intense. He still suffers from nausea, and occasionally from sickness; but often has a fair appetite. His bowels vary; are occasionally a little constipated; but, on the whole, partly under the influence of enemata, partly of their own initiative, act regularly and freely, sometimes two or three times a day. The evacuations are mostly semi-fluid, and once or twice of late have been accompanied by a little discharge of red blood, but are otherwise normal in quality. The abdomen remains full and more or less tense, and usually free from tenderness; but handling it, or exposing it to the air, generally brings on attacks of colic. The urine is free from sugar and albumin. His temperature has occasionally risen to 100°, but has remained almost continuously normal or subnormal.

I have no particular remarks to make on this case, excepting that the presence of a tumor which had been observed off and on for some time, and the progress of events, led to the belief that this patient, like the last, was suffering from abdominal malignant disease; and that, although an operation was not looked upon at all hopefully, it was (considering the invariably unfavorable issue of all my other similar cases) thought desirable to afford him even this shadow of a chance of relief.

It will be admitted, I think, that in their main clinical features each of the foregoing cases was so much a counterpart of every other, that it was only natural that, as case after case came under observation, the family likeness they presented among themselves should be noted, and that they should stand out in my mind as a characteristic group. The points in which specially they resembled one another were: the frequent attacks of painful colic associated with visible and violent peristaltic action of the smaller bowel, the absence of anything like complete intestinal obstruction, their chronic progress, and their invariably fatal tendency.

The cases with which (looking at them after the event) one would be disposed to compare them are cases of obstructive disease of the colon, cases of disease of the cæcum, and cases of acute obstruction of the smaller bowel. But the differences between those several affections and my own cases are for the most part obvious. In obstructive disease of the colon, the patient may, of course, have had premonitory symptoms lasting over many months, but death is generally due to the coming on of insuperable constipation with its usual accompaniments; he may, of course, have attacks of colic and of visible peristaltic movement, but these for the most part follow on complete obstruction, and even then are rarely, if ever, so continuous or so violent as they were in my cases. It is admitted that the larger bowel is, as a rule, less readily excited to violent peristaltic action than the smaller bowel; and in disease of the colon, the lesser bowel usually takes but little active part in this process, owing doubtless to the fact that the ileo-cæcal valve readily allows fluid or semi-fluid matters from above to be transmitted into even a distended colon, while it prevents any regurgitation, and the small intestine consequently is protected to a large extent from the direct influence of the stoppage below.

In diseases of the cæcum, at any rate in typhlitis and in malignant disease involving the wall of this viscus, there are of course local pain and tumor, but there is not generally at any time absolute stoppage; and although, no doubt, in some cases the smaller bowel becomes after a time excited to undue peristaltic action, it must be very seldom if ever that one meets with such persistent and violent peristalsis as my cases exhibited. I have met in the last few years with three cases of fatal cancer of the cæcum; but in none of them was there serious obstruction, and in none were attacks of colic noted.

Diseases of the small intestine attended with complete obstruction are always, so far as I know, acute, and, as a matter of fact, are either intussusception, strangulation, incarceration, volvulus, or the impaction of a large gall-stone. I need scarcely say that in all these cases the symptoms come on suddenly, the cases are of acute progress, and violent peristaltic movements of the bowel are either very slight or conspicuous by their absence.

My cases all fall clinically, as I have already stated, into the category of cases which Dr. Hilton Fagge termed "contraction of the small intestine," and which correspond to the strictures of the large intestine. That is, they are cases of chronic obstructive disease of the smaller bowel; but they are cases in which the patient dies, not from the supervention of complete stoppage which usually brings these latter cases to an almost sudden close, but from the gradual influence of the impediment over the bowel above and the gradual induction of innutrition and asthenia. One main reason for the different termination of these two varieties of obstruction is that in the larger bowel the fæces tend to solidify and become difficult of passage through a narrow orifice, while the contents of the small bowel remain, as a rule, semifluid or pulpy and transmissible to some extent to the last. It is obvious that the combination and progress of symptoms in such cases as I have brought forward are determined less by the nature of the disease present than by its seat. As I have shown, the clinical phenomena in all my cases were as nearly as possible the same; and yet in two the obstruction was due to adhesions compressing and embarrassing the bowel; in one it seemed to be referable to a kind of stricture produced by some localized inflammatory condition in the intestinal wall, and in two it was caused by malignant disease—in one certainly involving the ileo-cæcal valve and the ileum in its neighborhood, in the other almost certainly affecting identically the same parts. I may add that I have met with more than one case of chronic intussusception in adults implicating the ileo-cæcal valve, in which the symptoms were in great measure the same; and that disseminated tubercles or cancer of the peritoneum, associated with adhesive inflammation, may, of course, have the same effect on the bowels as adhesions resulting from simple inflammation. It may be asked why the three cases of cancer of the cæcum, to which I have referred above, differed so much in symptoms from the two cases narrated at length. The important difference is this: that in the former cases the walls of the cæcum were the special seat of disease, and there was no real obstruction; whereas in the only one of the latter two cases which has terminated fatally the disease originated in the situation of the valve, and caused marked obstruction at this point, which was of course equivalent to obstruction of the lower end of the ileum itself.

I have said little as to treatment; and I have to acknowledge that I have very little to say. My patients were treated mainly with opium, either given by the mouth or administered subcutaneously, which I need scarcely say was of immense service in relieving pain and in restraining the violent movements of the bowels. As a general rule, the bowels acted pretty freely of themselves, but occasionally, when constipation had existed for a few days, and the excessive peristaltic action was in abeyance, a small dose of castor oil seemed serviceable and enemata afforded some relief.

Next as regards operative measures. My attempts to relieve by puncturing the bowels were not successful, and I am not sure that I shall try it again in such cases. For even though the bowels are distended and resonant on percussion, there is no doubt (I think), judging from the history of the cases, as well as from post-mortem evidence, that the chief distention is due to the accumulation of thin fæcal matter; and this suggests a possible source of danger. At any rate, the punctures, as a matter of fact, gave exit to very little gas, and afforded no relief. The most important question, however, is, Should an exploratory operation be performed? I am bound to say, looking back upon my cases, that I do not think an operation would have been of real benefit in any of them. It is extremely difficult, even at a post-mortem examination, to cope successfully with old adhesions causing very considerable matting together of bowel. Such difficulties must be greatly enhanced during life. I do not myself think that in either of my first two cases such a dissection could have been successfully performed. In neither of the other three (I mean the case of narrowing of the lower end of the ileum, and the two cases of malignant disease) do I think an operation would have been of the slightest benefit; indeed, in the last it had to be abandoned. At the same time I am free to confess that, looking to the unamenability of these cases to medical treatment, to their almost certainly fatal outlook, to the possibility that some such cases may really be due to lesions capable of successful surgical treatment, and to the fact that abdominal section is now a comparatively simple and safe procedure, I should be disposed in most cases, if not to urge, at any rate to sanction, the performance of an exploratory operation.

THE TREATMENT OF DERMATITIS HERPETIFORMIS.[1]

By Louis A. Duhring, M.D.,
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In the several communications on this disease that have been published by me during the past five years, no special remarks have been made concerning its treatment. The subject-matter of these papers has been largely confined to a statement of the cases observed with the view of setting forth the symptoms and the more important clinical facts, in the hope that the disease might become better known. A number of cases (perhaps ten or twelve) have been reported by me, and others have been observed in my private and public practice, so that now it seems appropriate that something be said about the treatment of this exceedingly rebellious disease. At the same time, I would state here that in many cases the remedies employed, both external and internal, seemed to exert but little or no beneficial effect. In severe cases, and especially during an exacerbation, no form of local treatment used appeared capable of making a favorable impression on the skin. In such instances the disease is the most difficult to influence of all the inflammatory affections, surpassing even inveterate eczema.

The internal treatment may first receive attention. The generally-recognized observation that the disease may arise from and be dependent upon several distinct or even diverse causes, precisely, for example, as occurs in the case of eczema, precludes positive statements as to remedies. Each group of cases, based on the etiological factors at work, requires special handling, and hence I believe no class of remedies can be recommended which would be suitable to all cases. The origin of the disease, where this is ascertainable, should ever be kept in mind, and the treatment be pursued in this direction on general principles. With a disease which in most instances is exceedingly persistent and chronic in its course, a speedy cure is not to be looked for, either from internal or local remedies.

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[1] Read before the American Dermatological Association, September 3, 1890.

I shall make my remarks as practical as possible and be brief. The local treatment may first be considered. It must be remembered that the disease, as a rule, is multiform in character, and that, as in the case of eczema, we have to deal with varied lesions, at one time erythema, at another vesiculation or pustulation. The several varieties of the disease, therefore, naturally call for different formulæ, certainly as to strength, and sometimes even for different remedies. Thus, my experience has shown that milder preparations are required for the erythematous than for either the vesicular or bullous, and I would here remark that this (erythematous) variety is the most difficult of all to control by local means, while the vesicular is the most easily influenced. It is not my purpose at present to take up the treatment of the several varieties of the disease specially, but rather to ask attention to the principles of treatment applicable to the disease as a whole. From a therapeutic standpoint the affection may be considered under the headings of acute, subacute, and chronic, the two latter stages being those we are generally called upon to treat. It must be kept in mind that the disease involves in most cases the greater part of the general surface; that therefore there is a good deal of cutaneous surface requiring attention, and that the remedies must be selected and prepared to meet that end. Another difficulty that we have to contend with is that the eruption tends to repeat itself in the form of more or less frequently recurring outbreaks or crops, a new one often coming out before the old one has disappeared, the skin thus being in a peculiar state, interfering with and complicating the treatment. It is this condition and the variety of elementary and secondary lesions generally present at the same time that render the treatment so difficult. Almost all the cases that have been under my observation have been chronic, and previously had undergone all manner of treatment; in some instances at the hands of competent dermatologists. Long experience has taught me that the disease is most difficult to control, and that some of the remedies from which good results might be looked for—such, for example, as are useful in eczema—exert but little or no influence in arresting the process. The milder so-called soothing preparations, as boric acid, calamine and oxide of zinc lotions, ointments, and pastes, sometimes so useful in acute or subacute erythematous and vesicular eczema, are of no value in this disease. I have long since arrived at the conclusion that the only class of remedies from which benefit is to be expected is stimulants, especially those which act revulsively. I will first enumerate a few of the more important substances that have been employed. These are: Tar, in the form of oil, ointment, and alcoholic and alkaline tarry lotions; carbolic acid, sulphur, Vlemingckx's solution of sulphurated lime, thymol, ichthyol, hydronaphthol, resorcin, and fluid extract of grindelia robusta. On account of the peculiarity of the eruption, including its multiformity, mixed acute, subacute, and chronic stages, and distressing subjective symptoms, it is difficult both for the patient and physician to estimate the value of any remedy. Such sufferers, moreover, are seldom content to remain long under the care of any one physician, hoping continually to derive benefit from frequent change of treatment. Of the remedies just referred to, the most valuable is sulphur, and in the form of ointment, about two drachms to the ounce. I was first led to employ it through the statement of a patient many years ago, who had derived more benefit from it than from any other substance. He had suffered long with the vesicular variety, and had sought the advice of many physicians without obtaining even temporary relief. On one occasion, in desperation, he rubbed himself vigorously with a strong sulphur ointment, made soft by the addition of walnut oil. This afforded immediate and gratifying relief, such as no other application had ever given, and, moreover, soon caused the eruption to disappear. On subsequent occasions he had again employed it, and he regarded it as the most valued remedy known to him. The remedy and mode of application seemed to me harsh and unlikely to succeed, but a trial proved satisfactory and bore out the statement made. My experience with it leads me to regard it as especially useful in the vesicular and pustular varieties, and also in the bullous, but that in the erythematous variety it usually proves irritating. Let me here say, however, that in some cases it has failed to act favorably, and I by no means wish to lay too much stress on its value, nor to put it forth as a specific. I merely desire to state that in the vesicular variety it is the best remedy that we are acquainted with. It should be applied with friction and with sufficient force to break down the vesicles, pustules, and blebs as speedily as possible. As already intimated, the ointment should be strong, about two drachms to the ounce, and should be used in the manner indicated, with the view of making a positive impression on the skin, by causing, as it were, local shock to the nerve-endings. The rubbing should be long continued and thorough. It is useless merely to smear it on, as the object by this means is not accomplished. In suitable cases acceptable relief to the itching and burning is usually obtained after one or two applications. Remedies of this class, I believe, are the kind from which most benefit is to be looked for. They should not be too harsh nor too stimulating in their action. The strength and the amount of friction must be regulated by the effect. They should be applied as early in the attack as possible, as soon as the lesions begin to form.

In some cases tar, especially in the form of the alkaline solution known as liquor picis alkalinis, is useful, especially in allaying the itching. It is, of course, to be diluted, one drachm to about eight ounces of water, according to the caustic effect produced. Another equally valuable tarry solution, and one that is safer to use, is that known as liquor carbonis detergens, an alcoholic solution of coal-tar. This also is to be similarly diluted, though sometimes it may be advantageously used strong, one drachm to from one to four ounces of water. Both of these preparations are useful in relieving itching, but I do not think that they exert much influence in arresting or modifying the progress of the eruption, and hence they can hardly be looked upon as curative. In the erythematous variety they prove of most value, because here the friction ointments are usually not tolerated. Ichthyol I have used in varied strength, in the form of ointments and lotions, and, as in the case of tar, the latter have proved more serviceable, but the remedy is not so efficient as tar. Nor can I speak favorably of resorcin, thymol, and carbolic acid. The last-named remedy, especially, has proved less useful than one would expect, considering its well-known powers in other allied inflammatory states of the skin. Of the various remedies and combinations which have been employed on various occasions none can be specially recommended, and hence they need not be enumerated. Baths, for the most part simple and hot, have been used with some benefit in relieving the burning and itching. A patient exhibiting the erythemato-vesicular variety, recently under my care, regarded a hot bath of an hour's duration at night as grateful, but he did not seem to sleep better than when it was omitted. The same patient had, during a previous severe attack, endured a fortnight's experience with the continuous bath, which had afforded a certain amount of ease and comfort, but had not proved in any degree curative.

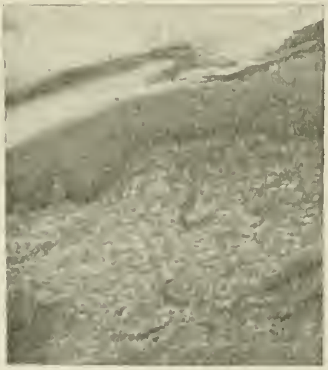
Concerning the internal treatment not much that is favorable can at present be said. With a disease tending to pursue an emphatically chronic course, speedy cure is hardly to be expected. This observation is borne out by experience. Several cases under my notice some years ago recovered in a short time under, for the most part, internal treatment, but I am not prepared to state that the cure was due to the remedies used. In the relapsing and obstinate form, relief is to be obtained, I believe, only from such remedies as favorably impress the nervous system. The cutaneous symptoms are such as point distinctly to the neurotic nature of the disease. The eruption, as a whole, possesses features in common with the well-known and established neurotic inflammatory diseases, such as herpes simplex, herpes zoster, herpes iris, and pemphigus. The nervous system, it may be centrally or peripherally, is undoubtedly in some manner and in a variable degree deranged, and it is to aid this important function that we must look in the choice of remedies. Among such drugs I would first speak of arsenic, which in suitable cases offers, I believe, more hope of benefit than any other remedy. By suitable cases I mean more particularly the simple, uncomplicated chronic cases, whose history and cause are obscure, and not those manifestly due to a deranged uterus and the like. At the same time, from my experience and from that of some other practitioners with whom I have been in communication on the subject, it must, on the whole, be regarded as disappointing. No reliance can be placed upon it, and sometimes it seems rather to aggravate the disease. Upon inquiry I have found that most of the patients who have been under my observation had at one time or another previously taken a course of arsenic, and without experiencing much, if any, benefit therefrom. I may add that it has often been a matter of surprise to me how little influence, for good or for bad, it possessed over the disease. While, therefore, some cases seem to have been benefited, the majority have not been so, possibly, in some instances, because the drug had not been administered in sufficiently large doses. In one case, however, very large doses of Fowler's solution (as much as forty or fifty minims a day) were tolerated, and seemed for the time being partially to control the bleb-formation, but the results, upon the whole, were not beneficial. I believe it to be well worth a trial in the vesicular and bullous varieties, and the dose should be gradually increased. From the well-known power of arsenic to relieve and to cure some cases of true pemphigus, one would naturally look for good results in suitable cases of the disease under consideration, which is, without doubt, allied to the pemphigus process. As far as our knowledge of the treatment of dermatitis herpetiformis extends to-day, no other remedy offers so much hope of benefit in suitable cases, and the results, whether beneficial or harmful, should be duly chronicled with the reports of future cases. Of the value of quinine and strychnine, there is not much to be said beyond that they do not appear to possess any special power over the disease. The same remark may be made concerning certain other general remedies that have been employed—as, for example, iron, cod-liver oil, and ergot. In several cases that are called to mind, it was thought that the hygienic influences of change of air and scene might prove beneficial by giving tone to the nervous system, but in this the results were not commensurate with the trouble incurred. But I would by no means undervalue both moral and hygienic treatment, both of which should receive full consideration, for experience with this disease shows that in most cases general physical and mental depression are conspicuous features.

A CASE OF CYSTITIS, WITH THE FORMATION OF A THICK EPIDERMAL SHEET IN THE BLADDER—PACHYDERMIA VESICÆ.

By A. T. Cabot, A.M., M.D.,
of Boston.

The following case was reported before the American Association of Andrology and Syphilology, at their fourth annual meeting, in the hope that some member of the Association could put the writer on the track of the report of similar cases. None of those present had seen or known of such cases, except Dr. J. A. Fordyce, of New York. He brought to the meeting photo-micrographs obtained from sections of the bladder and ureter of a patient that he had seen on the autopsy table in Vienna, but of which he could give no clinical history. The condition shown in these photographs was exactly similar to that found in the case which forms the text for this paper, and one of them has been accordingly reproduced here (see Fig. 1).

Fig. 1.



Photogravure reproduction from a photo-micrograph of a dermoid sheet in the ureter. The sheet of epithelium lies on the connective tissue below with papillæ running up into it. Some exfoliation is shown on the surface. (From Dr. Fordyce.)

Dr. Fordyce also called the writer's attention to an article by Posner in Virchow's *Archiv*, upon "Dermoid Changes in Mucous Membranes," and it is to this article and other German investigations referred to by Posner, that this paper is indebted for the pathological consideration of the subject.

The following is the clinical history of the case:

The patient, James E. B., was a strong-looking man aged forty years. In 1870 he was cut for stone by the lateral perineal method. The wound healed in about three weeks, leaving no fistulous track. Always after this time urination was more frequent than normal. Five years ago, he had an attack of acute cystitis, accompanied by much pain; and from that attack the bladder never wholly recovered, giving him at times much trouble, but never, until the present illness, compelling him to stop work.

In the middle of June, 1889, when feeling quite well, he had a sudden stoppage of water. For this he saw a doctor, who passed an instrument into the bladder, with some relief of his symptoms; and, shortly after, he passed a small phosphatic stone. He had severe pain for a week, and this continued, though somewhat less in degree, up to the time that he was seen by the writer, on August 2, 1889. The pain was felt just before, during, and after passing water, and lasted for about a minute after the act of urination was finished. Occasionally a few drops of blood came in the last part of the stream. The urine was loaded with mucus and pus, and contained many pavement epithelial cells, both singly and in clumps; it was usually colored somewhat by the presence of blood; it passed in a fairly good stream.

An examination with a sound at this time did not find a stone, but showed a slight narrowing in the deep urethra, at the site of the old operation. There being but little improvement under treatment, he was sent to the Massachusetts General Hospital for a more thorough investigation under ether.

In this examination the sound failed to touch a stone or any calcareous matter, but, after the exploration, a washing with the Bigelow evacuator brought away several small papillomatous-looking masses. These bits were examined by Dr. W. F. Whitney, who reported that they were composed of papillary masses of epithelial cells mixed with lime salts; and, though they did not have the branched forms common in papillary growths in the bladder, it seemed probable that they came from a papillomatous tumor.

It was, therefore, decided to do a suprapubic cystotomy to remove the growth; and this operation was done on September 5, 1889. The Garson-Peterson method was followed. The bladder held seven ounces of boracic solution, and the rectal bag was distended with about fourteen ounces.

On opening the bladder, the posterior wall was seen to be of a whitish-yellow color, and to the finger it felt stiff, and was rough on the surface. The rest of the bladder-wall was normal in appearance. It was presently found that a thick membrane could be detached from the diseased surface, and, with care, could be peeled off with the fingers in sheets of one or two square inches area. It was loosely attached, and after removal left a smooth surface, which bled but slightly. The wall of the bladder which it left felt soft and supple.

This membrane having been removed as thoroughly as possible, the bladder was drained by a double rubber tube carried to the bottom of the cavity, and an antiseptic dressing was applied.

The operation was followed by very little fever or discomfort, and the wound did uninterruptedly well. On the fourth day one tube was removed and a catheter was tied in through the urethra. On the ninth day the remaining tube was taken out, and the wound rapidly closed; so that, on the eighteenth day, the catheter was finally left out, and the patient passed water by natural efforts.

Urination was now quite frequent, and the urine showed a large trace of albumin and contained considerable ropy pus with an admixture of blood. This condition of the urine improved quite rapidly under the daily injection of a solution of nitrate of silver, one grain to three ounces, and, at the same time, the capacity of the bladder steadily increased.

The patient finally left the hospital on October 31st, at which time he could hold his water for from one and a half to two hours, the bladder having a capacity of about four ounces. There was still quite a large amount of sediment in the water, which consisted chiefly of mucus, but which for some days had begun to contain a number of epithelial flakes similar to those noticed before the operation.

After leaving the hospital, he continued the bladder irrigation, using a boracic solution twice a day; and every second day, in addition to this, he injected the bladder with a solution of nitrate of silver, two grains to the ounce, taking care afterward that this wholly escaped.

Under this treatment, supplemented by the occasional passage of sounds to keep the deep urethra properly dilated, he slowly improved, gaining both in power of holding water and in general condition. During the winter he took turpentine for a time, which cleared the urine somewhat; and, later, under the moderate use of sandal oil, the improvement was still more marked.

In May, 1890, he was finally able to resume hard work. He then weighed as much as he ever did. The urine still contained considerable sediment, but it was of a light flocculent character and there was no appearance of blood. There were whitish clumps of epithelium in it, but these were lighter in texture and not so large as the solid white masses that it formerly contained.

A thorough rectal examination was made at this time, but nothing abnormal could be detected about the posterior bladder-wall.

In August, 1890, he continued well, and the urine no longer contained any of the epithelial flakes or clumps. It was still somewhat cloudy from a slight admixture of mucus.

The membrane removed at the operation covered an area of about forty-five square centimetres, and when fresh was from two to three millimetres in thickness, varying within these limits in different parts.

Fig. 2 shows very well the microscopical appearance of a cross-section of this membrane. It is composed of epithelial cells, which are arranged much as they are on the surface of the skin.

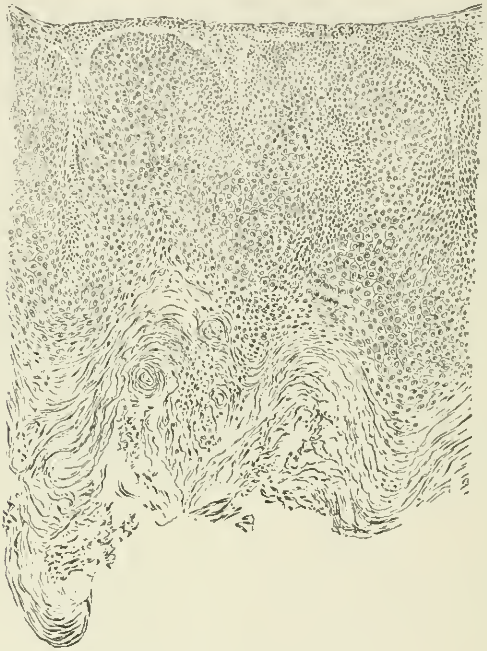
In the deeper parts they are penetrated by papillæ of connective tissue, and the cells are square or rounded, while, as the free surface is approached, the cells become flattened like ordinary epidermal cells, and on the surface they are being exfoliated in ragged flakes. In places, near the surface, there are well-marked onion bodies, or epidermal pearls; but at no part are these to be found in the lower layers of the epithelium.

There is, in the lower part of the horny epithelium, a well-defined stratum of cells containing kerato-hyalin—which is a proof, if any were needed, that these are true dermoid cells.

At no place is there any apparent tendency of the epithelial elements to burrow down into the connective tissue beneath, after the manner of a cancer.

The mucous membrane of the bladder is normally covered by several layers of epithelial cells, which in the deep parts are more or less rounded, and on the surface are flattened. Krause and Oberdieck[1] describe four layers of epithelium; and the latter has determined the thickness of the epithelial portion of the mucous membrane to vary between 0.036 and 0.068 millimetre in the empty bladder, and to be about one-half to one-third as thick in the full bladder.

FIG. 2.



Cross section of membrane.

The epithelial layer forms a flat sheet on the connective tissue beneath, and has no papillary arrangement such as exists in the deep layers of the skin.

The membrane in the case reported, which was made up entirely of epithelium, was therefore from fifty to one hundred times as thick as the epithelial layer normally existing on the bladder-wall, and its nourishment was provided for by papillæ thrown up by the connective tissue below.

These papillæ are entirely unusual in this locality, yet they nowhere showed any tendency to go beyond limits of growth that are physiological in other parts of the body. There was at no point any formation of extremely long, branched papillæ, such as are seen in papillary growths of the bladder. In short, the condition resembled the hyperplasiæ that are met, not uncommonly, on other epithelial surfaces as the result of long-acting irritations. On the skin we have corns and callouses, due to a pathological process almost exactly identical. There is, however, this difference, that whereas in the skin we have a simple hypertrophy of the horny layer which is normally present on that surface, we here have the formation of a highly-developed horny layer on a surface on which true epidermal cells do not normally exist.

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[1] Ueber Epithel u. Drusen der Harnblase, etc. Göttingen, 1884.

Virchow[1] has described a similar condition of the mucous membrane of the larynx, which he has named "pachydermia laryngis." He has shown that, when the mucous membrane of the larynx is exposed to persistent irritation, the epithelium may become much thickened into many layers and cornified, while papillæ are thrown up out of the connective tissue below. This change he noticed only on those parts of the larynx where the epithelium is of the pavement variety. And he regards those parts of the laryngeal mucous membrane which normally have pavement epithelium, as allied to the outer skin, and, therefore, subject to changes and pathological processes such as are met with on the skin, while the portions of the larynx which are covered with ciliated epithelium—*i. e.*, the more properly mucous surfaces—he thinks, are not subject to these changes.

Posner[2] points out, however, that the kind of cell on a given surface is not a reliable guide in determining the relation of that surface to others which seem to resemble or to be allied to it. Thus the nasal cavities, which are infoldings of the ektodermal layer, and are, therefore, allied to the outer skin, are covered with ciliated epithelium and are plentifully supplied with mucous glands—in short, are covered by a true mucous membrane.

Posner, therefore, divides the question of the cornification of mucous membrane into two parts: (1) Can mucous surfaces covered with cylindrical cells undergo dermoid changes? And (2) Can surfaces of a meso- or ento-dermal origin take on a dermoid character?

The first of these questions he answers easily in the affirmative, and brings forward in proof many observations showing the change of cylindrical epithelium into dermoid cells.

The second question is, however, the one that particularly interests us in connection with our cases; for the bladder, being derived in the embryo from the sinus urogenitalis, is distinctly of entodermal origin, and has no close relationship, therefore, with the external skin.

In the consideration of this question Posner points out the frequent occurrence of the dermoid change on the mucous membrane of the upper portion of the vagina in cases of prolapse. Similar changes are also observed in the uterus, in the larynx, and in the male urethra. It is to be remembered, however, that the anterior portion of the urethra—*i. e.*, all of the canal anterior to the constrictor urethræ muscle—is of ektodermal origin, being formed by an infolding of the outer epithelial layer, so that only when dermoid changes are found in the deep urethra can they be regarded as occurring on mucous membranes of entodermal origin.

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[1] Berl. klin. Wochenschrift, August, 1887.

[2] Virchow's Archiv, vol. cxviii., 1889.

When we come to the bladder we find instances of dermoid changes extremely few and doubtful. V. Antal has reported a case of epithelioma of the bladder in which all the histological characteristics of the outer skin were observed. Even the kerato-hyalin layer was there. Posner justly says, however, that great care is necessary in such cases, to be sure that the tumor is primary on the mucous membrane. He also quotes a case of Marchand's[1] to show to what extent the epithelium of the skin may grow over onto the mucous membrane of the bladder. In this case, a boy with a perineal fistula following lithotomy, had the bladder, the ureters, and the pelves and calices of the kidneys covered with a lining of horny epithelium which had grown in from the skin.

These are the only instances that Posner has been able to find of epidermal changes of the mucous membrane of the bladder. He considers neither of them as clear examples of a change (umwandlung) of the vesical mucosa into epidermis, but rather as instances of transplantation or of direct growth of epidermis onto the bladder by continuity of tissue.

Whether the case presented with this paper can be accepted as an undoubted instance of the bladder mucous membrane undergoing an epidermal change must be decided by the consensus of opinion of those best able to judge.

The fact that the patient had a lithotomy many years before, introduces the doubt whether here we have not a case of the growth of the epidermis of the skin over on to the mucosa of the bladder. It is to be remembered, however, that the perineal wound was open for only three weeks, that it then healed solidly and smoothly, and that there is now no dipping in of the skin, such as is seen in cases of old fistulæ.

It seems to the writer that this rapidity of healing precluded the possibility of any continuity of growth of epithelium between the skin and bladder, such as occurred in Marchand's case.

Furthermore, the clinical history of this case seems to throw some light on the etiology of the affection. After the operation the clumps of epithelium exfoliated from the dermoid surface reappeared in the urine, persisted, though in diminishing amount, for more than six months, and only finally disappeared after about ten months. This would seem to show that the dermoid condition continued over portions of the bladder-wall, and was finally so modified by treatment that all evidences of it vanished.

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[1] Naturforscher Versamlung zu Wiesbaden.

The nitrate of silver injections were not of a strength to destroy epidermal tissues, and no other part of the treatment could be supposed to have any power to effect the destruction of this membrane.

All of the treatment was directed against the cystitis, and the disappearance of the dermoid flakes coincidently with the mitigation of the inflammation in the bladder would suggest that the dermoid condition was induced by the irritation of the cystitis, and disappeared *pari passu* with the cessation of this irritation.

Virchow has shown that *pachydermia laryngis* has resulted from not unsimilar irritations of the mucous membrane of the larynx, and the writer is inclined to the view that in his case the dermoid change in the bladder was a result of the chronic cystitis.

In making a diagnosis of this condition in future cases the points to be taken into consideration are the chronic character and obstinacy of the cystitis, and the presence in the urine of flakes and clumps of horny epithelial cells.

It seems quite possible that a pachydermia vesicæ exists not infrequently in a less degree than in the case reported and goes unrecognized. The appearance in the urine of considerable numbers of flakes of epithelium is not uncommon in the course of severe cystitis, and that the dermoid condition should not be recognized on the autopsy table may well be due to the maceration which the epithelium rapidly undergoes after death. This is so great that in order to obtain correct ideas of the condition of the epithelium in a normal bladder it has been necessary to inject the bladder immediately after death with absolute alcohol to fix the cells and prevent their separation. The present more frequent performance of suprapubic cystotomy will probably give us opportunities to recognize this dermoid change during life.

With the cystoscope the whitish color of the surface might perhaps be appreciated, and in places where the edge of the membrane was sharply defined, characteristic pictures might be obtained. It would probably, however, be very difficult to distinguish this condition from some of the yellow surfaces furnished by tuberculous ulcerations of the bladder.

As far as we can judge from this one case, the treatment of a similar condition should be directed to the allaying of the inflammation. Certainly the injections of nitrate of silver seemed to answer an excellent purpose. And every measure that allayed the irritation and enabled the patient to carry his water longer and to urinate with less pain was followed by a corresponding diminution in the amount of pus in the water and in the number of epithelial flakes.

Dr. J. P. Bryson, of St. Louis, suggested the possible utility of injections of salicylic acid solution. He said that he had had excellent results from the use of these solutions in the treatment of cystitis, and he thought they would be peculiarly applicable in cases of this sort, for salicylic acid has the well-known power to remove warts, corns, and other growths of hyperplastic epithelium.

If milder methods of treatment fail, and resort to operation seems indicated, the suprapubic section affords the only satisfactory method of dealing with the membrane; for its separation and removal by the limited route through the perineum are manifestly impossible.

THE TREATMENT OF ARTERIO-VENOUS ANEURISM, WITH TWO CASES TREATED BY EXTIRPATION.[1]

By B. Farquhar Curtis, M.D.,

ATTENDING SURGEON TO ST. LUKE'S HOSPITAL AND TO THE NEW YORK CANCER HOSPITAL.

Case I.—John S., twenty-eight years of age, single, a factory-hand, born in the United States, was admitted to my service at St. Luke's Hospital, December 20, 1889. The patient's family history was good, and he had always enjoyed good health. Four years before he had contracted syphilis, but it had never affected him seriously. Thirteen years before, he was shot in the right leg with a pistol ball of .22 calibre, entering (from the left side) near Hunter's canal, and remaining in the tissues. The leg swelled at once after the injury, and he could not walk for two months, but he never felt any pain. One year later he first noticed a pulsation in the popliteal space, and thinks that he discovered a thrill at the same time, but the limb occasioned him no trouble, and he worked and walked as usual. One year ago the veins in the leg became greatly swollen, œdema of the leg and foot appeared, and ulcers formed on the leg, which caused him great pain. His condition gradually grew worse, and last week the pain kept him awake at night.

Examination: The right lower extremity is much increased in size, and six inches above the patella it measures 19½ inches in circumference as against 15½ inches in the left; and below the tuberosity of the tibia the right leg measures 15¼ inches in circumference, while the left measures only 11½ inches. The veins of the entire extremity are distended and very numerous, and strong pulsation can be seen in the superficial veins about the knee and over the thigh—except on its inner and upper surface. Below the knee there is no pulsation in the veins. The venous distention and pulsation are most marked on the outer side of the thigh, even as high as the great trochanter. When the soft parts of the thigh are pressed between the hands a strong expansive pulsation is felt. The skin of the leg is of a dark bronze color, thickened and scaly, and there is an ulcer one-half of an inch in diameter, and of chronic appearance, situated on each side of the leg near its middle.

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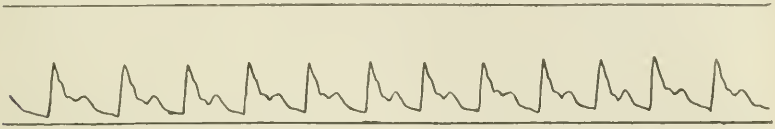
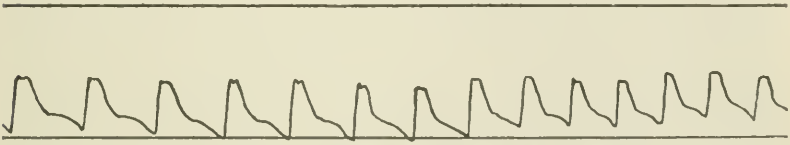
[1] Read before the New York Clinical Society, April 28, 1890; second case reported December 26, 1890.

There is a faint scar at the point where the patient says that the bullet entered—near Hunter's canal.

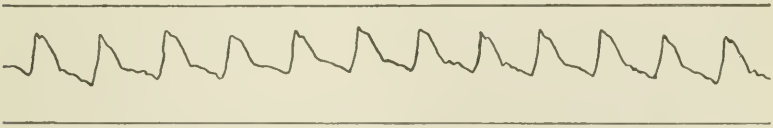
There is a general expansile pulsation visible in the popliteal space, and the skin here is œdematous, but no well-defined tumor can be made out. A very strong pulsation can be seen and felt along the femoral vessels, and extending over Poupart's ligament, where a pulsating tumor can be felt over the external iliac vessels, about the size of a hen's egg. It is impossible to distinguish between the pulsation of the artery and that of the vein. There is a very strong thrill to be felt over the popliteal space, and this thrill is conducted upward along the femoral vessels into the tumor above Poupart's ligament, and it is also to be felt in the superficial veins of the thigh, but not in those below the knee. This thrill is continuous, but its intensity varies with the arterial pulse, being most marked at the apex of the pulse-wave. Corresponding to the thrill a loud, rough murmur can be heard over the same area by bringing the ear into contact with the leg, but not at a distance; the murmur is also continuous, its intensity varying with the pulse-wave, and has all the characteristics of the murmur heard in arterio-venous aneurism. One of the surgeons who examined the patient thought that he could detect pulsation and thrill in the anterior tibial artery, and perhaps on that occasion some unusually favorable position of the limb rendered this possible, but none of the other surgeons were able to recog-



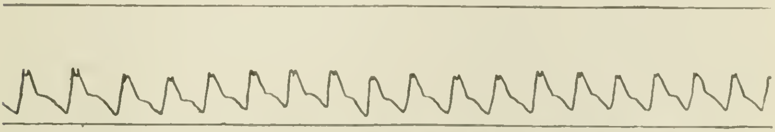
John S. Right radial: pressure 3¼ ounces. January 18, 1890.



Over tumor in popliteal space; pressure 2½ ounces.



Over tumor on inner aspect of thigh; pressure 3 ounces.



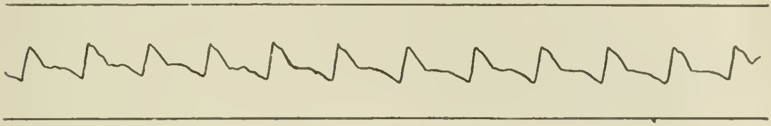
Femoral, 6 inches below Poupart's ligament; pressure 3¼ ounces.

nize any peripheral pulse in spite of frequent and careful examination. Pressure upon the femoral artery below Poupart's ligament, or at the apex of Scarpa's triangle, stopped the pulsation and thrill in the popliteal tumor, and at the same time the tumor above Poupart's ligament grew smaller and lost its pulsation. Very forcible pressure was necessary to control the pulsation of the vessels in any part of their course. The strongest pulsation, thrill, and murmur were observed to be situated on the outer side of the popliteal space—not over Hunter's canal.

The patient was kept in bed for a fortnight, during which the extremity grew much smaller and the ulcers healed. A distinct tumor could then be recognized in the upper and inner part of the popliteal space, toward Hunter's canal, about the size of a hen's egg. The heart-sounds were normal and the apex-beat lay three and a half inches to the left of the median line and external to the nipple.

Operation, January 20, 1890. The patient was etherized and Esmarch's bandage was applied to the thigh, after a rubber bandage had been fastened around the leg below the knee (to form a reservoir of blood to facilitate dissection), and leaving also the blood in the sac and its neighborhood. All of the very numerous vessels crossing the incision were divided between double ligatures. Drawing the nerve to the inner side, we reached the tumor, which filled the entire popliteal space, and was found to consist of the popliteal vein, immensely distended, and forming a sac three and a half inches long and one and a quarter inches in diameter, the distended part passing quite suddenly at each end into the vein of normal size. The sac was not adherent anywhere, and it was easily enucleated from the surrounding tissues, there being but one small branch given off from the vein (on its anterior aspect) in the whole length of the distended portion, until the upper angle of the popliteal space was reached. At this point the communication between the artery and vein was found, and such a sheaf of branches was given off from the latter that it was necessary to enlarge the incision upward for three inches (a total of seven inches) before the true relations of the parts could be ascertained. It was finally made out that the artery and vein were connected by a short passage, about a quarter of an inch long and of about the same diameter, with walls of the thickness of the arterial walls, about half an inch below the ring in the adductors, and that, directly opposite the opening in the vein, six or seven branches sprang from the latter by a common trunk, the combined area of their openings being fully equal to the calibre of the vein itself. This short venous axis was directed outward, and this fact explained at once why the pulsation and thrill had always been so strong under the outer hamstring. Besides these vessels, there were others given off from the external and anterior surfaces of the vein, and a large vessel arose from the short channel of communication between the artery and vein, passing downward and appearing to be one of the muscular arterial branches. The dissection was made very difficult by the tangled mass of veins, but finally they were all secured. The artery was ligated above and below the point of communication, and about half an inch of it was cut away, including this point. A small branch of the artery just below also required ligation. The vein was secured above and below the dilated part, and the latter excised. The Esmarch constrictor was removed, and so thoroughly had even the smaller vessels been secured, that only two or three more ligatures were required. The artery was of normal size, and its walls of normal thickness, so far as it was exposed in the wound, while the veins were all enlarged and their walls much thicker than natural. A drainage-tube was inserted and the wound closed with catgut sutures. When the dressing was completed, a very faint capillary circulation was found to be present in the toes, as was shown by the return of color when the blood was pressed out of them. The circulation improved daily, and became natural by the fourth day, and on that day the sensation in the foot, which had previously been rather blunted, appeared to be normal.

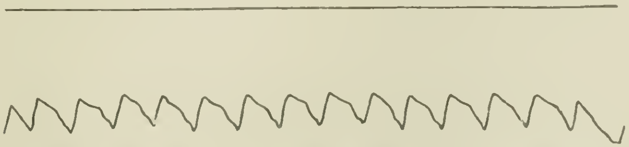
About two weeks after the operation, when the wound had healed, and after the patient had been sitting up for a day or so, about a drachm of pus was discharged from the upper angle of the wound, apparently coming from a considerable depth.



John S. Femoral, 5 inches below Poupart's ligament. February 25, 1890.

February 26th, the patient was discharged. The right thigh then measured 18 inches in circumference at the groin, 15 inches at the junction of the middle and lower thirds, and 14⅝ inches above the patella. The right leg measured 12½ inches in circumference below the knee, and at the junction of the upper and middle thirds 11¾ inches. There was no pulsation to be felt in the popliteal space. A large artery courses down upon and external to the outer hamstring, very superficially, and the anastomotica magna can also be felt quite distinctly. Pulsation in the femoral and external iliac arteries is more forcible than natural, but less so than before the operation. There is still something of a tumor above Poupart's ligament, but it is much smaller and does not pulsate so forcibly. (In the following May, the condition of affairs was about the same.)

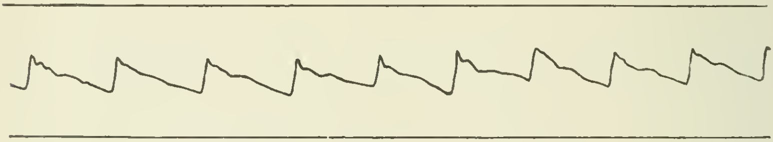
Case II.—William McC., twenty-four years of age, single, born in New Orleans, a laborer by occupation, was admitted to St. Luke's Hospital, suffering from a crush of three fingers of his left hand, October 30, 1890. He has always enjoyed good health, and denies syphilis. About nine years ago, he was shot in the right knee, with a pistol, the ball of which entered on the inner side and emerged from the outer. A very large pulsating tumor appeared at the point of injury (as large as the head of a young child, according to the patient's account), and he felt a strong thrill which extended up into his body. He had no surgical treatment,



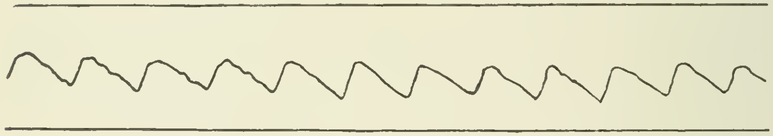
Wm. McC. Right femoral at Poupart's ligament. November 3, 1890.

but kept his bed until the wound healed. The tumor gradually diminished in size, and in a few weeks he was working as usual. Five years ago, he injured the skin over the right tibia, and since that time has had a succession of ulcers, which, although of small size, were very painful. He has a feeling of numbness and coldness in the right foot, and that limb is more easily fatigued than the other.

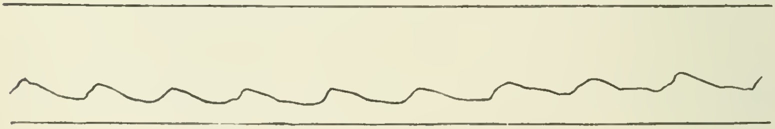
Examination of the limb shows an ovoid tumor between the internal condyle and the hamstring of that side, projecting one inch above the level of the limb, and measuring five inches vertically and two and a half transversely. This tumor pulsates strongly and expansively, and the skin over it is traversed with distended veins, which, however, do not pulsate. There is also a diffuse pulsating swelling in the popliteal space, more prominent externally, where the hamstring tendons appear to be flattened out over it. At the most prominent part of the first tumor, just above and behind the epicondyle, is a scar, where, the patient says, the ball entered; and in a corresponding position on the outer side of the knee is a slightly larger scar, which, he says, is the wound of exit. An enlarged artery is felt passing down along the anterior border of the first tumor and on the inner side of the patella, and along the outer border of that bone is a similar vessel. The anterior and posterior tibial arteries cannot be felt. The veins of the leg and thigh are distended, but there is no pulsation in them, except in one large vein, which appears under the skin at the back of the middle of the thigh and turns around its inner border to empty into the deeper veins at the saphenous opening, and the pulsation in this vein is increased by pressure upon it just before it reaches that point, showing that it receives the pulsation distally. Over the tumor can be felt a very strong arterio-venous thrill, most distinct near the wound of exit, and the same thrill is felt in the pulsating vein just described, and at the saphenous opening, where it is nearly as strong as at the wound of exit. The thrill is not conducted into the



Left radial; 3 ounces. November 26, 1890.



Over tumor, outer part of popliteal space; 3 ounces.

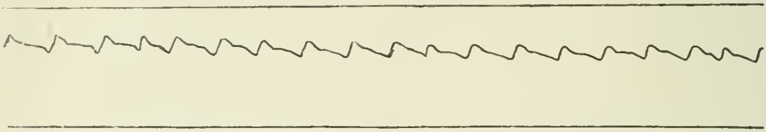


From pulsating vein near saphenous opening.

tissues surrounding the aneurism, but is felt along the great vessels of the thigh, although not so distinct as at the saphenous opening. A very loud and rough arterio-venous murmur is heard over the aneurism and wherever the thrill can be felt, and it is also transmitted through the tissues of the entire limb, being heard with the stethoscope in the sole of the foot. Pressure upon the femoral, anywhere from Poupart's ligament to Hunter's canal, will stop the pulsation, thrill, and murmur, and the artery can be compressed without the use of very great force. The right leg does not differ from the left in size, condition of skin, or hair, but it bears a very tender ulcer, about an inch and a half in diameter, in the midst of a scarred and pigmented area. There is no œdema, and the veins are not greatly distended.

The patient was kept in bed for some time, until the ulcer had practically healed, and he had recovered from the injury to his hand, and during this time the pulsation, thrill, and murmur diminished very noticeably. December 8th, it was noticed that there was no thrill in the tumor which projected between the condyle and hamstring on the inner side of the knee, and that it had also disappeared from the dilated vein described as emptying into the saphenous opening. Very slight pulsation was occasionally observed in a vein in front of the internal malleolus. No thrill could be detected in the vessels immediately above Poupart's ligament, in spite of the distinct thrill and loud murmur at the saphenous opening, and this circumstance, together with the fact that both were so much more distinct at that point than along the great vessels in the thigh, make it probable that they were intensified there by the cross current from the superficial distended vein, and were not conducted along the femoral vessels. The murmur was also less marked over the internal part of the tumor than in the popliteal portion.

Operation, December 11, 1890. Ether anæsthesia. Rubber bandage around the calf to secure a reservoir of blood below the wound to aid in dissection if necessary. Esmarch bandage applied to the thigh, leaving the sac free from compression. An incision seven or eight inches long was made over the popliteal space in the median line of the limb, extending up to the middle of the thigh. When the fascia had been divided, the entire popliteal space was found filled with the sac of the aneurism, and this was separated from the surrounding parts with a little difficulty, for it was somewhat adherent. The popliteal nerve was not seen during the operation. Some large vessels communicating with the sac were found on its outer aspect, lying quite superficially, and were divided between double ligatures. The lower end of the sac was then turned out of its bed and found to be divided into three lobes by deep grooves, the central lobe lying between the heads of the gastrocnemii. The internal lobe lay to the inner side and in front of the inner hamstring, which had formed the sulcus between it and the middle lobe. The external lobe lay under the outer hamstring, which was expanded over it, and was divided from the middle lobe by a groove formed partly by the tendons, partly by the vessels as they twisted around the sac. The entire sac was then readily dissected out, and it was found that the vessels already tied off were the popliteal artery and vein, which lay on the outer side of the sac, passing spirally around it, from their exit from Hunter's canal above and in front of the sac, to the middle of the popliteal space below and behind it. The remains of the vessels were sought in the wound, and about an inch of each was removed in the neighborhood of their communication with the sac. The vessels lay side by side at their point of communication with the sac, and probably opened into it on their internal and anterior aspect by a common orifice. The specimen was injured at this point in the dissection, and it was impossible to ascertain their exact relationship. There were no other vessels opening into the sac. All vessels had been tied in the wound as they were divided, and only a few points required ligature after the removal of the Esmarch. The wound was closed by a continuous catgut suture, a gap being left in the middle of the popliteal space for drainage, and a small tent of iodoform-gauze was inserted into it. A pad of iodoform-gauze was placed next the wound and bichloride dressings applied. The entire foot and limb were wrapped in cotton. Even immediately after the operation was concluded, the circulation in the toes was fairly good, the blood returning quite promptly when pressed out by the finger, and the next day it was normal. The operation lasted two and one-half hours.



Femoral in Scarpa's triangle; 4 ounces. December 31, 1890.

The sac resembled the inverted human heart in shape, and measured when distended three and one-half inches from base to apex, three inches across its broadest part, and two and one-half inches in thickness from before backward. Its walls were formed of laminated cellular tissue and its shape also showed its origin as a diffuse (traumatic) varicose aneurism. The sac was partly filled with firm clot on the side opposite to its communication with the vessels. The vein was of normal size, the artery being also normal above, but contracted to about two-thirds of its natural diameter immediately below the point of communication with the sac.

The wound healed by primary union, except in its central portion, where the displaced tendon of the semi-tendinosus made some pressure. The patient feels well, and his ulcer has healed, but it is too early to say whether it is permanently cured.

William Hunter and Guattani first recognized the aneurisms connected with both arteries and veins, and explained their pathology, but we owe the name arterio-venous aneurism to Virchow. The division of these aneurisms into varicose aneurism (a sac connected both with an artery and with a vein) and aneurismal varix (in which a direct passage exists between the two, without the formation of a sac) originated with Scarpa. These subdivisions answer for the classification of most cases, but it is necessary to recognize an intermediate form in which the artery communicates directly with the vein, and there is no separate sac, but in which the vein is so greatly distended at the point of communication as to form a sac—a variety of which my first case is an example, and which has been especially described by the French authors.

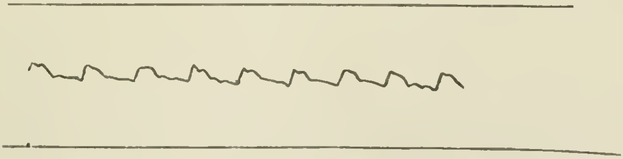
Although these aneurisms belong anatomically to the class of aneurismal varix, they are clinically similar to varicose aneurisms, having the same tendency to growth and liability to rupture.

When a communication has been established between an artery and a vein, the walls of both vessels undergo certain changes, and their calibre alters, and these changes are of great importance in considering the safety of applying a ligature to the artery, and to the vein as well. The older writers undoubtedly exaggerated the extent and frequency of these changes. The veins, as a rule, are distended, although not always, and their walls become thickened. According to the majority of authors, the calibre of the artery above the site of the communication becomes enlarged, but Bramann expressly states that the artery generally remains normal unless endarteritis is present. As no one else appears to have analyzed the reports of so large a number of cases as this writer, I have carefully sought the original records of his cases as far as they were accessible, accepting his own summary when they were not, and have analyzed thus 81 cases in which an operation or an autopsy allowed the vessels to be examined. The condition of the artery is noted in 33 cases, in 19 of which the calibre of the vessel was enlarged above the communication with the vein, and in four others both above and below. In 10 cases it is expressly stated that the vessel was not enlarged above, in 5 of which it is also said to have been healthy below. In 7 cases, moreover, in which the artery was enlarged centrally, it was not enlarged peripherally. The presence of endarteritis is mentioned in only two of the cases. In 3 cases it is stated that the artery was contracted beyond the aneurism. It would appear from this showing that Bramann is incorrect in his assertion, and that the commonly-accepted opinion that the artery is frequently dilated above the aneurism is much nearer the truth. On the other hand, in reading the reports of recent operations, I have been much struck by the fact that the artery was found to be normal in so many cases, as it certainly was in my first case. In my second the artery was normal above, but contracted below. Perhaps this difference is due to the fact that the operation is now performed before the changes have progressed as far as they were formerly allowed to go. The cause of this enlargement of the artery is unknown, and as we do not even know as yet whether the blood-pressure at this point is increased or diminished, we must wait for more knowledge before a satisfactory theory can be framed.

As to the condition of the artery beyond the aneurism, the figures already given show that it is generally normal, but that it may sometimes be contracted, even when it is dilated above. But there are four exceptional cases in which there was a general enlargement of the peripheral artery and its branches. One of these we can explain by general atheroma, as the aneurism was originally arterial, becoming varicose by perforation of a vein. In two other cases the temporal artery was involved, and, although we cannot assume the presence of atheroma, for one patient was only eighteen years of age, the liability of this vessel to form cirsoid aneurisms may account for the change. The fourth case was Dupuytren's, occurring in the thigh of a young man who was wounded six months previously, at the site of the aneurism, in Hunter's canal—and it is totally inexplicable. The opinion that the artery is usually contracted below, appears to have been formed from the fact that the peripheral pulse was weaker than normal, but this is an unreliable sign, for the pressure of the tumor might cause a diminution of the pulse-wave, even when the artery retained its normal calibre. The mere loss of blood by leakage into the vein may cause a weakness of the peripheral pulse, as is very beautifully proven by the case of Müller (*Archiv. f. klin. Chir.*, xv., 1873), in which a soldier was wounded in the left arm, near the axilla, by a rifle-ball, and an aneurismal varix formed without a tumor, but with great distention of the superficial veins. Six months after the injury, the radial pulse could not be felt unless pressure was made so as to prevent the flow of blood from the artery into the vein, when, with the cessation of pulsation in the veins, the radial pulse became distinct, only to disappear again on removal of the pressure. Eighteen months later the condition remained the same, showing that an artery can remain of normal calibre for years, even if its usual blood-supply is very much reduced, and also that absence of the peripheral pulse does not prove diminution of the calibre of the vessel at that point.

As the artery dilates, its walls are apt to grow thin, and some would ascribe the thinning of the arterial wall to the diminished blood-pressure, but it is by no means certain that the arterial pressure is less than normal, and in some cases it is apparently greater—certainly an increased force of pulsation of the artery is a very frequent symptom. The sphygmographic evidence, which might throw light upon this point, is not yet extensive, but so far as it goes it favors the idea of an increased blood-pressure in the artery. Dr. Keen has published a tracing from the radial artery in a case of arterio-venous aneurism of the flexure of the elbow, before and after the operation, and it shows a much more forcible beat on the diseased side before the operation, the difference between the two sides disappearing almost entirely after the operation. Richet also found a similar difference between the two radials in a case of arterio-venous aneurism of the bend of the elbow, in which the tracing was made by the celebrated Marey himself—but unfortunately no tracing was made after the operation. These cases, then, indicate a rise in blood-pressure in the artery beyond the aneurism, and imply that the obstruction to venous return of the blood may project itself into the artery through the capillary system even although the latter does not show any signs of it. The evidence of these cases is not weakened by such cases as that of Müller already quoted, in which the radial pulse was lost on the diseased side, for the seeming contradiction can undoubtedly be explained by differences in the size or position of the communication between the vessels, or in some other mechanical conditions.

There is also evidence of increased pressure in the artery *above* the aneurism in some cases. Ebenau's tracings in Czerny's case (*Berlin. klin. Wochenschr.*, 1883, 19) of a small aneurism in Hunter's canal, taken (it was supposed) over the femoral vein, probably give a combination curve of both artery and vein. It is a very remarkable curve, with a broad apex indicating a high blood-pressure. In my cases, Dr. Joseph A. Blake and Dr. L. F. Warner, house surgeons of the hospital, made tracings with Dudgeon's sphygmograph from the popliteal tumor itself, from a dilated vein, and from the femoral vessels; it was impossible to distinguish between the artery and the vein. As no peripheral pulse could be felt, no tracings could be made beyond the aneurisms. All the tracings are very similar, showing an arterial curve of high tension with a broad apex—in the first case made up of two sharp points. In tracings made after the operation, these peculiarities are absent. One might be tempted to explain the double apex as due to pulsation in the vein immediately following that in the artery, but as the same characteristic is found in the tracing made over the tumor, I think we must attribute it to a vibration of the lever of the instrument on an unusually broad apex, due perhaps to the very forcible pulsation of the vessels.



Case of Dr. R. F. Weir. Femoral above the aneurism.

Dr. Robert F. Weir has kindly given me permission to show a tracing made in an unpublished case of his by Dr. Ellsworth Elliot, Jr., also with Dudgeon's instrument. The aneurism was a small sac connected with the anastomotica magna artery and vein, and the tracing was made over the femoral vessels above the tumor.[1] The curve is similar to that in my cases. It is interesting to compare the curve over the sac in my cases with that obtained by Bramann in v. Bergmann's case of axillary aneurismal varix, the latter being a purely arterial curve. On the whole, although the tracings indicate increased tension in the artery above the aneurism, they differ so much that we need more material before any definite conclusions can be drawn from them.

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[1] A lad of fourteen years, who had wounded himself with a sharp iron rod four weeks before. Extirpation. Cure. Sac nearly one inch in diameter.

The symptoms and diagnosis of arterio-venous aneurism require but slight notice here. The signs which are spoken of by most authors as invariably present, and which are certainly pathognomonic when they are found, are the thrill and murmur. But the thrill is sometimes absent, and the murmur may be of the ordinary arterial bruit type, so that such careful observers as Czerny and Annandale thought that they had to deal with arterial aneurisms until the true nature of their cases became evident during the operation. No particular cause was discovered which would account for the absence of these important symptoms in their cases. Perhaps the sphygmograph may help us in the future. If it were proposed to apply the Hunterian ligature in such a case, on the supposition that the aneurism was of the arterial form, the mistake would be a very serious one, for this method of treatment is a very dangerous one in arterio-venous aneurism.

TREATMENT.—Arterio-venous aneurisms have proven peculiarly recalcitrant to the simpler means of treatment, and, owing to their relatively good prognosis, surgeons have dreaded to undertake the more serious operations by which alone they could be cured. But if the records of these operations are examined, it becomes evident that the principal dangers incurred are such as have been greatly diminished by the advances of modern surgery. The older surgeons were certainly justified in thinking that the evils of this condition were seldom sufficient to justify exposing the patient to the dangers of primary and secondary hemorrhage, gangrene and pyæmia, which operations at that time implied ; but the Esmarch bandage and the artery-clamp render hemorrhage easily controllable during the operation, and with the improvement of the materials for ligatures and the freedom from septic complications in the after-course of the wounds, ligature of large veins without bad consequences is a matter of daily occurrence, and secondary hemorrhage and sepsis have become rarities, so that the views of modern times have changed very considerably, and operations have become more frequent.

Compression.—Compression has failed, as a rule, in these aneurisms, except in cases which were treated very early and in which superficial vessels were involved. Pressure has generally succeeded only when applied so as to occlude the opening between the artery and vein while it was also exerted on the artery above. In some cases the aneurism was converted into the arterial form and then completely cured by the Hunterian ligature. Among 26 cases of reported cures by compression collected by Bramann, 20 were in the brachial, 2 carotid, and 3 femoral. (Note that his lists give a total of 63 cases of brachial arterio-venous aneurisms, and 46 femoral and popliteal cases.)

The methods of galvanism and of injection of coagulating substances into the sac are totally inadmissible in these cases, although there have been a few instances of cure by these means, for the danger of embolism is very great on account of the direct communication between the sac and the vein, and I am surprised to find that so good an authority as Holmes still admits them to a place among methods worthy of trial.

Hunterian ligature.—The results of the single ligature applied above the lesion,[1] generally after the Hunterian method, for this form of aneurism, have been very bad. Van Buren collected 24 cases, and adding to them the cases in Bramann's list, which were so treated, and a few from other sources, I find the following results:

CASES OF HUNTERIAN LIGATURE FOR ARTERIO-VENOUS ANEURISM.

VESSEL.	Gangrene occurred.	RECOVERED.			Died.	Total cases.
		Cured.	Improved.	Unimproved.		
Common carotid	..	...	2	1	1	7
Subclavian . , ...	..	...	...	...	2	2
Brachial	2	4	...	9	6	19
Common iliac	1	...	...	...	2	2
Internal iliac (gluteal) . .	...	1	...	...	...	1
External iliac	4	...	...	2	5	7
Common femoral	2	1 (amputated)		...	1	2
Femoral superficial	2	1	...	6	3	10
Anterior tibial	...	1	...	...	...	1
Totals	11	8	2	18	23	51

According to this table, we have only 8 cures in 51 cases, including 1 case saved by amputation after gangrene set in. We will not consider the mortality as shown by this table, for in order to collect a sufficient number of cases it was necessary to use very old ones, and the most frequent causes of death were sepsis and secondary hemorrhage, and will only note that the operation failed to cure one-third of the cases. But I wish to draw attention to the great frequency of gangrene as compared with the same operation performed for arterial aneurism. That both cases of ligature of the common femoral caused gangrene is not surprising, but note that there were 2 cases of gangrene in 19 ligatures of the brachial, 2 in 10 of the superficial femoral, and 4 in 7 of the external iliac. Gangrene after ligature of the brachial is an exceedingly rare accident, and in 77 cases of ligature of the femoral for popliteal aneurism Holmes (*System of Surgery*) found only 3 cases of gangrene, while Norris (AMERICAN JOURNAL OF THE MEDICAL SCIENCES, 1847, xiii. p. 13) found 11 cases of gangrene in 95 of ligature of the external iliac. These facts have completely condemned the operation for use in the extremities, and the high mortality of the operations in the neck condemns it there also. The greatest care should therefore be taken to exclude the possible existence of an arterio-venous aneurism, when it is proposed to perform the Hunterian operation in any case of aneurism of the extremities. The explanation for the frequent occurrence of gangrene in these cases given by Stromeyer (*Handbuch der Chirurgie*, 1844) is undoubtedly the correct one, namely, that when the collateral circulation is established and the blood finds its way past the ligature into the artery beyond, it flows directly into the vein through the communication with that vessel, instead of passing on to the peripheral circulation. Therefore, an accidental inclusion of the vein with the artery in the ligature would actually be a favorable occurrence.

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[1] Of course the single distal ligature has never been applied to these aneurisms.

Double ligature of the artery.—The double ligature of the artery above and below the point of communication, treating the latter as a simple wound of the vessel, and without attacking the sac itself, has given fairly good results. Of 15 cases we find 9 cured, 2 relapsed, 1 recovered after amputation for gangrene, and 3 died. Of the deaths all were in pre-antiseptic times, 1 was due to gangrene, 1 to secondary hemorrhage, and 1 to amputation on account of secondary hemorrhage. We shall return to the question of gangrene later. Two cases relapsed—Norris's, situated upon the brachial, and Davies-Colley's, upon the femoral in Scarpa's triangle. In the first case the relapse was due to an arterial branch given off from the sac, which fed it after the ligature was applied; and in the second it is supposed to have been due to the premature softening of the catgut ligature. The cause in Norris's case illustrates the strongest objection to the method, and among the cases of this disease examined by operation or post-mortem will be found many which have the same anatomical arrangement, making a cure by this method an impossibility; for instance, those of Brainard, Ollier, Venturoli, v. Wahl, and myself. As bearing upon this point we may also quote the case of Galozzi (Bramann, Case 127), who tied the external iliac without improvement, and some days later tied the femoral in Scarpa's triangle below the sac, also without effect—the number of branches given off in this location readily explains the bad result. We may also note Stimson's case (AMERICAN JOURNAL OF THE MEDICAL SCIENCES, 1884, lxxxvii. 325, and *N. Y. Med. Journ.*, 1888, i. 214, 555) of aneurismal varix between the common carotid near its bifurcation with the internal jugular vein, in which he tied the common carotid with temporary improvement, and four years later secured both the external and internal carotids beyond the point of communication between the artery and the vein without lasting result, the intermediate part of the artery evidently being fed by the superior thyroid, as pressure in the course of that vessel caused the thrill to cease.[1]

Ligature of both vessels.—A greater security against relapse from this cause is obtained by ligature of both the artery and the vein close to the sac. It is not absolutely necessary to ligate the vessels peripherally, for central ligature of both vessels has produced a cure in two cases (Moore, Keen[2]), although this practice is certainly not sufficiently reliable to be recommended for general adoption. In three cases the artery was ligated above and below, and the vein peripherally only, or centrally only, all being successful—unless we except Davies-Colley's (the second operation in this case), in which it was supposed that the catgut ligature softened prematurely, causing a partial relapse which necessitated a third operation in which the artery was ligated again below. In two cases both vessels were secured above and below. We have then 7 cases of ligature of both vessels, 6 cured, and 1 in which relapse took place from softening of the ligature on the artery. They include 3 at the flexure of the elbow, and 1 each of the temporal, femoral, popliteal, and tibial arteries.

We may note in passing that Monmonnier (Bramann, Case 93) cured an arterio-venous aneurism at the flexure of the elbow, of short duration, by obliterating the basilic vein above and below the point of communication, by passing pins beneath the vessel and making figure-of-eight turns of a ligature over them. Stromeyer claims to have cured a temporal arterio-venous aneurism by ligation of the vein alone beyond the point of communication, but he also ligated another vessel (which he thought to be a vein) which communicated with the varix and was accidentally wounded in the operation—moreover, the pulsation and thrill continued after the operation and the wound healed with long and tedious suppuration, so the cure may fairly be ascribed to the effect of this inflammation around the sac.

Incision and ligature—The so-called ancient method of treating aneurisms by incision and ligature of the vessels, with which we may also include the cases in which the vessels were ligated before the sac was laid open, is a more satisfactory method than simple ligature, and it is also generally easier of execution. The cases of incision of the sac with ligature of the vessels number 17. Among these there were 5 deaths and 1 recovery after amputation of the limb, but all of these accidents occurred in pre-antiseptic times, and they were all due to sepsis or secondary hemorrhage; the fatal cases being thus distributed—1 brachial, 3 femoral, and 1 popliteal, and the amputation having occurred in a popliteal case. Of the 11 cured, 2 were temporal, 6 brachial, 2 popliteal, and 1 tibial. It should be noted that all but 4 of these 17 cases were operated upon prior to 1870.

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[1] Dr. Stimson tells me that the man is still alive, the aneurism unaltered.

[2] Dr. Keen informs me that his patient was free from any return when he last saw her, about two years after the operation.

Extirpation.—An equally reliable method is that of extirpation of the aneurismal sac, of which I have the records of 20 cases. There is only one death in this series, which was due to sepsis, although it was operated upon by a capable surgeon in 1878, affording an illustration that accidents will sometimes occur in the course of wound-healing even in modern days. Relapses were impossible, consequently all of the remaining 19 cases have been cured. The cases are thus distributed: temporal 4, radial (fatal) 1, brachial 3, axillary 1, articular artery of the knee 1, anastomotica magna 1, femoral 6, and popliteal 3.

Results.—To gain a proper idea of these operations upon the sac, or upon the vessels near the point of communication, we must group them together, for the differences between them as to danger to life and limb may be considered about equal, since, although the extirpation of the sac may require more time than incision, this appears to have produced no effect upon the mortality, the only death in the 20 cases of extirpation having been due to sepsis, and not to the prolonged operation. Moreover, the accidental fact that most of the cases of extirpation were performed since 1870, while those of incision were performed before that date, gives the former almost no mortality, and the latter a death-rate of nearly 33 per cent. We have, then, a total of 60 cases treated by these various operations, with 47 cures, 2 relapses (both in operations upon the artery alone), 2 limbs lost by amputation, and 9 deaths. All but one of the cases in which life or limb was lost were operated upon before 1870, and in all but two sepsis was the cause of the accident. In these two gangrene occurred, and this brings us to a question which has been left until now for our study.

In 21 operations upon the brachial there was one case of gangrene, in 16 upon the femoral there was 1 case of gangrene, and also Billroth's fatal case of incision with ligature of both artery and vein, in which, on account of secondary hemorrhage, the artery had to be tied again above the origin of the profunda, and gangrene followed. On account of the known frequency of gangrene after ligature of the common femoral, we may regard this case as bearing only upon aneurisms so situated that a ligature of the common femoral would be necessary. The other case of gangrene from ligature of the femoral was Dupuytren's case of incision and ligature for a varicose aneurism in Hunter's canal, in which the arteries of the entire limb were degenerated, and in which the unnatural condition may have had something to do with the result. The case of gangrene after ligature of the brachial was a varicose aneurism of the flexure of the elbow operated upon by Roux with ligature of the artery alone above and below the sac, after continuous pressure and bandaging had been kept up during the three years of its existence, and Roux very plausibly refers the gangrene to a diminution of the blood-supply of the limb, owing to this treatment. In addition to these 37 cases, there are 9 operations upon the popliteal, and 1 upon the axillary artery without gangrene—a total of 46 operations upon the main artery and vein of a limb with only 3 cases of gangrene, even including Billroth's, results which are so good that, bearing in mind the peculiar character of those 3 cases, we can safely say that in the ordinary arterio-venous aneurism (after a duration of one month) there is less danger of gangrene in securing both vessels near their point of communication than there is in applying the Hunterian ligature for true arterial aneurisms.

Conclusions.—We have seen that compression is only suitable for cases which are seen early, and in which the affected vessels lie superficially; and if it is not successful at once, or, if its employment is difficult or painful, the risks of operation are not sufficiently great to warrant delay. It is my conviction that all these cases should be treated by operation, with the single exception of the cases involving the internal jugular, or requiring ligature of the common femoral artery and vein. It does not appear necessary to distinguish between aneurismal varix and varicose aneurism as to treatment. The choice of methods depends upon the size and situation of the aneurism. In a general way, it may be said that all small aneurisms not involving the larger vessels of a limb should be extirpated unless important nerves are jeopardized by the dissection, or, as on the face, it is important not to leave a scar. The treatment selected for larger aneurisms depends upon their situation. Those of the neck which involve the external jugular vein will rarely require treatment, but should it be necessary, such cases are best treated by double ligation of both vessels. In other situations the simple ligature of the vessels should not be chosen, for it will, in most cases, require as much dissection as will incision or extirpation, while not giving the same immunity from relapse. The surgeon should make an incision down upon the sac in its entire length, and attempt to dissect it from its bed. If this prove difficult or impossible because of inflammatory thickening or intimate connection with important parts, the sac should be incised, for it is often easier to secure the vessels when the sac is freely opened. The sac could then be left entirely in place, or it could be partly removed, and it may be as well to say that suture and simple drainage of the sac have been found sufficient, and that it is unnecessary to resort to packing. In closing, we must not forget that the recently-introduced suture of veins, and the successful experimental suture of arteries, may alter our methods of treatment in some of these cases—in fact, Bassini (*Riforma med.*, 1890, April 15, 16) has already cured a case by double ligature of he artery and suture of the opening in the vein.

LITERATURE OF CASES.

To economize space I quote only the numbers of cases in Bramann's list which are correctly referred to by him, but I have verified his cases in the originals, except Cases 55 and 148, which were not accessible. I have included in my list only cases of four weeks' standing or more, for those of shorter duration are more correctly studied as wounds of artery and vein than as aneurisms.

Double Ligature of Artery.

Dupuytren: Breschet, Mém. Acad. roy. méd., Paris, 1833, iii. 226.

Norris: AMER. JOURN. OF MED. SCIENCES, 1843, v. 28. (First operation.)

Roux: Quarante Années de prat. chir., Paris, 1855, ii., Cases XXXVI. to XXXIX., pp. 286 to 295.

Malgaigne: Bull. Soc. anat., Paris, 1858, xxxiii. 355.

Hamilton: Holmes, Lancet, 1874, ii. 543.

Blomfield: Lancet, 1881, ii. 829.

Davies-Colley: Guy's Hospital Rep., 1888, xiv. 348. (First operation.)

Championnière: Bull. Soc. chir., 1888, Paris, xiv. 39.

Branham: Internat. Journ. of Surgery, New York, Nov., 1890, p. 250.

Bramann: Arch. f. klin. Chir., 1886, xxxiii. 1. Cases 55, 66, and 117.

Ligature of Both Vessels.

Moore: Med.-Chir. Trans., xli. 1; and Brit. Med. Journ., 1857, 972.

Keen: Med. News, Phila., 1887, ii. (vol. li.) 725.

Roux: Loc. cit., Case XXXV. p. 271.

Davies-Colley: Loc. cit. (Second and third operations.)

Bramann: Loc. cit., Cases 89, 148, and 155.

Incision.

Breschet: Loc. cit., p. 219.

Bérard: Compend. chir. prat., ii. 127; and Arch. gén. méd., 1845, sér. iv. T. vii. p. 38.

Norris: Loc. cit. (Second operation.)

Brainard: Illinois and Indiana Med. and Surg. Journ., 1848. N. S. ii. 505.

Roux: Loc. cit., Case XL. p. 299.

Richet: Bull. Soc. chir., Paris, 1862, 281; and Gaz. des hôp., 1861, p. 215.

Nélaton: France méd., 1863, 197.

Nélaton: Reclus, Bull. Soc. chir., Paris, 1863, 285.

Billroth: Chir. Klinik. Wien., 1868, 158.

Verneuil: Reclus, loc. cit., p. 280.

Bramann: Loc. cit., Cases 46, 109, 3, 74, 8, 149, 156.

Extirpation.

Ollier: Mém. Soc. méd. Lyon, 1865, iv. Part 2, 159; and Reclus, loc. cit.

Beach: Boston Med. and Surg. Journ., 1867, lxxvii. 361.

Thorndike: Boston Med. and Surg. Journ., 1878, xcix. 475.

Robinson: Brit. Med. Journ., 1887, ii. 885; and Path. Trans., London, 1888, xxxix. 85.

Trélat: Delbet, Bull. Soc. chir., Paris, 1889, xv. 153, 491.

Menocal: Rev. de Cien. Med., Habana, iv, 1889, 161.

Graziani: Riforma Med. Napoli, Jan. 7–10, 1890.

Simons: Trans. South Carolina Med. Assoc., Charleston, 1890, p. 125.

Weir: *Curtis*, this paper.

Bramann: Loc. cit., Cases 49, 2, 7, 154, 122, 137, 10, 139, and 159.

REVIEWS.

THE MICROÖRGANISMS OF THE HUMAN MOUTH. By WILLOUGHBY D. MILLER, D.D.S., M.D. Pp. 364, with 130 illustrations, including Photomicrographic Plates. Philadelphia: The S. S. White Manfacturing Company, 1890.

THE publication of this remarkable record of experimentation and research cannot fail to meet with a most hearty welcome from practitioners of medicine, while the dental specialist will hail it as the most valuable of all recent contributions to dental science.

Previous to the publication of Professor Miller's investigations the presence of microörganisms in carious teeth was fully recognized, and that they might be found to be important factors in the decalcifying process often suspected; but the credit of fully demonstrating the correctness of what, previous to his investigations, was but mere conjecture, belongs entirely to Professor Miller. Objections have been made to his deductions on the ground that he has not entirely solved the problem of dental caries, that he throws but little additional light upon predisposing causes; but while Professor Miller has been able to demonstrate the fact that all microörganisms of the oral cavity which possess the power of exciting an acid fermentation of foods may, and do, take part in producing the first stage of caries, and also that all possessing a peptonizing or digestive action upon albuminous substances may take part in the second stage; and finally, that those possessing both properties at the same time may take part in the production of both stages, he has by no means ignored the predisposing causes of caries. In Chapter VIII., under the general heading of "Etiology of Dental Decay," the subject is very fully considered. In the pathology of the teeth it is not in every case easy to draw definitely the line between predisposing and exciting causes. This is clearly illustrated in the case of the third molars, the so-called wisdom teeth, which are generally believed to be predisposed to caries, even in mouths where the more anterior teeth are of good quality. In these third molars decalcification almost invariably appears on their buccal surfaces, as well as in the depressions of the crowns; but these teeth are, in consequence of their positions, beyond the sweep of the tooth-brush, and not usually brought into full service in mastication, hence they are nearly always covered with particles of amylaceous substances, which, remaining from day to day, undergo fermentation, and solution of the softened residue soon follows. Professor Miller very clearly shows that while the conditions which are usually considered as predisposing causes invite decay, they do not produce it, and that if the active agents are kept away decay cannot occur, no matter how inferior in quality the teeth are.

In "Microörganisms of the Human Mouth" Professor Miller very concisely outlines the morphology and biology of bacteria. He describes the nutrient media for them as found in the oral cavity, their development, and the part they play as excitants of fermentation, together with the action of the products of fermentation on the different structures of the mouth.

Under the head of "Prophylaxis of Dental Decay" is found much valuable information relative to the use of antiseptics in the prophylactic treatment of decay, the antiseptic action of filling materials, and the sterilization of teeth for the purpose of implantation.

Valuable data, the result of a great number of experiments and much research, are given in Chapter X., under the head of "The Pathogenic Mouth Bacteria, and the Diseases which They Produce"; also in Chapter XI., "Entrance-portals of Pathogenic Mouth Bacteria," together with a record of a series of careful experiments in the study of Pyorrhœa alveolaris, the infections resulting from accumulations of the excitants of diphtheria, syphilis, typhus, etc., in the oral cavity.

The tables showing the relative efficacy of the different antiseptic agents, and the comparative acidifying power of different articles of food, add much to the value of the work as a text-book of dental histology. Indeed, it may truly be said that in that capacity it will for a long time remain without a rival.

The general make-up of the book is all that could be desired. The illustrations are distinct and accurate, and the publishers are entitled to much credit for the excellent manner in which their part in the production of the work has been performed.

Now that histology has become a requirement in some of the dental schools, Professor Miller's work must quickly become indispensable to students as a text-book, nor can the practitioner of dentistry afford to be without it, and the non-professional reader also might derive much advantage from its study. C. J. E.

DISEASES OF THE NOSE AND ITS ACCESSORY CAVITIES. By W. SPENCER WATSON, F.R.C.S. Eng., B.M. Lond., Surgeon to the Throat Department of the Great Northern Central Hospital; Senior Surgeon to the Royal South London Ophthalmic Hospital; formerly Assistant-Surgeon to King's College Hospital; Fellow of the Royal Medical and Chirurgical Society; Member of the Ophthalmological Society of Great Britain and Ireland; Member of the West London Medical and Chirurgical Society, etc. WITH SPECIAL SECTIONS ON DISEASES OF THE SKIN OF THE NOSE, ON INJURIES, ON RHINOPLASTIC OPERATIONS, AND ON EAR AFFECTIONS IN THEIR RELATION TO INTRA-NASAL DISEASES. By DR. ROBERT LIVEING, MR. WILLIAM ADAMS, and MR. A. E. CUMBERBATCH. Second edition, with numerous engravings and lithographic plates. 8vo., pp. 318. London: H. K. Lewis, 1890.

IF our recollection of the first edition of this work serves us correctly, that volume, for its date, was a far more valuable exponent of its subject than the present one seems to be. Some portions are much more thorough, practical, and representative of progress than others. This inequality is probably due to exigencies of practice favoring the author's experience in certain lines, in the discussion of which he is perspicuous and accurate, while he is discursive and uncertain in the discussion of certain other lines with which he is apparently less familiar. Hence many allusions are made to practices known to the author only from his extensive acquaintance with the writings of others. American authors receive a great deal of deference, especially Rumbold, Bosworth, and Sajous. To the practitioner who fairly knows his subject the book will be of far greater service than to the novice. Due allowance can be made where the general advance in pathology and therapy has not been maintained, and due appreciation be accorded where its authority is most excellent. Few unusual affections will be encountered in practice concerning which some valuable instruction or information as may be, will not be found in these pages. The text takes in a wide range of subject-matter; external nose, interior of the nose, and the adjacent and intercommunicating cavities, passages, and structures, and almost every morbid condition which ever occurs in these regions receives some consideration. The descriptions of healthy and diseased structures are good and often elaborate. The constitutional origin of disease is duly expressed. The risks of delay and of temerity are recounted; the advice as to management is sound; the surgical treatment adopted is judicious and conservative. Haphazard and hazardous procedures receive no endorsement. The illustrations of diseased conditions and of many appliances for their treatment and correction are admirably portrayed, especially in connection with diseases of the maxillary sinus and with destructive diseases of the nose.

In describing the methods of illumination with minute electric lamps attention is directed to a risk of their cracking and breaking into fragments. Voltolini's lamps, however, are enclosed in thick glass capsules which, we fancy, would maintain their integrity even though the lamp underwent fracture. We fully endorse a recommendation of the Welsbach burner as a source of illumination.

An original method of controlling the palate during rhinoscopic inspection, and one which the author finds superior to all other plans, is that of directing the patient to breathe rapidly in short gasps and to concentrate his attention on his chest movements to divert it from his throat. A plan to relax the palate which we have often employed, and which we have not seen anywhere described, is to get the patient to keep his structures in the position of a laugh during the examination.

In using cocaine preliminarily to evulsion of growths, the recommendation is given to apply with cotton wads freshly-made solutions in equal parts of glycerin and water, a combination which is stated to favor its penetration into the cavity.

For seizing polypi and other morbid growths to prevent their escape from the forceps or the snare, a two-pronged corkscrew-shaped tractor is recommended, which can be twisted into the growth, a device which seems to us most excellent in conception. A ring-shaped knife is recommended for the removal of portions of turbinated bodies with the polypi upon them. A peculiar sliding forceps, one branch of which works within a slot in the other somewhat like a clamp, devised by the author for use where the ordinary scissor-playing blades could not be entered, appears to us admirably adapted to the purpose.

Neuro-paralytic ulceration of the nasal mucous membrane is described, ulcers in connection with paresis of the fifth pair of nerves. This is a lesion which we do not remember to have been noted by other writers. The ulcers are said to progress steadily, though healing from time to time under generous diet and avoidance of exposure to cold. But one instance is mentioned, and in that one the patches of excoriation varied from the size of a split pea to that of an English sixpence. They were dry and sluggish, and increased in size from day to day, but almost imperceptibly.

These few points are illustrative of special practical features in the volume, which we are very glad to place beside its predecessor in the working portion of our library. J. S. C.

A TEXT-BOOK OF PRACTICAL THERAPEUTICS; WITH ESPECIAL REFERENCE TO THE APPLICATION OF REMEDIAL MEASURES TO DISEASE AND THEIR EMPLOYMENT UPON A RATIONAL BASIS. By HOBART AMORY HARE, B.SC., M.D., Clinical Professor of Diseases of Children and Demonstrator of Therapeutics in the University of Pennsylvania; Secretary of the Convention for the Revision of the United States Pharmacopœia of 1890. 8vo., pp. 622. Philadelphia: Lea Brothers & Co., 1890.

THERAPEUTIC handbooks multiply. Materia medica proper is in the background, and, to a considerable extent, justly so. The writer once heard a medical orator of deserved eminence (a surgeon) say in his address that the study of therapeutics should begin with medical botany, and then proceed upward through chemistry to its useful end. Most medical teachers, knowing the demands made upon the student for knowledge of diagnosis, and the great number of specialties in which a well-fitted man must attain a certain measure of proficiency, would say, with the writer, that although medical botany may be an elegant accomplishment for the practitioner, it is by no means a necessity, and to devote a large amount of time to it in an ordinary three years' course would be folly.

As a matter of fact, it is probably a very small proportion of students who have any real knowledge of botany of any kind, either when they enter or when they leave the medical schools of this country. Another view, and a much more plausible one, is that the student should be familiar with a large amount of experimental pharmacology; should, perhaps, have experimented himself, and upon this knowledge base his practical therapeutics.

I think most teachers of therapeutics would recognize the fact that a large amount of the experimental information gained within the last twenty or thirty years is of a kind which, if not useless for the study of practical therapeutics, is not capable of being utilized by the average student for that purpose, nor, indeed by any student, without very special and laborious study under skilled guidance.

The purely empirical school need not be dwelt upon. As a distinct school it is little in favor at present, but authors and teachers recognize the necessity of bringing to bear upon the study of the action of drugs, and especially their remedial action, all the resources at our command, and of harmonizing not only the experimental data furnished by different observers, but the facts acquired by careful clinical observation.

It is from this point of view that all the recent text-books have been written, and the one before us is another claimant for favor in this class.

The author possesses special qualification for this task in the work he has done in experimental pharmacology; but he has, notwithstanding this temptation, avoided the error of basing his statements exclusively thereon, and endeavored to show the bearing and connection of the two sets of facts, and their application to actual practice.

The work is divided into four parts for convenience of reference.

After a concise introductory section the second takes up the drugs of the *United States Pharmacopœia* and others in general use, in the alphabetical order, giving first a very brief description of the drug itself, and then stating its mode of action and its application in disease, as well as the methods of administration. In the case of the more powerful drugs, the symptoms of poisoning and its treatment are given.

The third part treats of remedial measures other than drugs.

The fourth part consists of sections upon the treatment of diseases and symptoms, arranged in the same way.

It is out of the question to criticise minutely a work composed of so many short articles of varying importance.

In the present state of materia medica, with its enormous numbers of drugs containing the same or closely-allied principles, and the extreme rapidity with which new compounds are being added by the chemist, it appears to the writer that one of the wants is generalization. This, however, it would be unfair to find fault with this book for not attempting, as it is hardly compatible with its plan and arrangement.

It appears, also, to the writer, to be a mistake to try to present, in the compass here admitted, a systematic plan of treatment for each one of the whole alphabetical catalogue of diseases. There is either too much or too little. However, the attempt having been made in this instance, it is fair to say that it is by no means altogether unsuccessful. The treatment suggested is judicious and practical.

There are, as is likely to happen in nearly all first editions—and it is fortunate if they are not continued—a few slips.

We may suggest that a person who tries the author's first plan of disinfection (p. 319), by heating sulphur in an *iron* pan over an alcohol lamp, is very likely to find himself involuntarily trying the second, where the sulphur is mixed with the alcohol.

Again, it is not easy to understand how the water which has been used to scrub the floor of an infected room can be afterward boiled.

In a future edition the slight air of hurry and sketchiness which seems to attach to the present one can easily be removed. E.

THE CROONIAN LECTURES ON CEREBRAL LOCALIZATION. BY DAVID FERRIER, M.D., etc. London. 1890.

THE world of scientific medicine will welcome, in book-form, the latest authoritative statement of cerebral localization by the foremost pioneer in this department of physiological research. This book is a reprint of Dr. Ferrier's lectures before the Royal College of Physicians. It is safe to say that it brings the subject entirely up to date. It is founded upon both experiment and clinical observations of the author and others. It is, of course, a statement of Dr. Ferrier's particular views, and is sometimes controversial, but the great amount of experimental work done by the author, and his accurate observation, go far to justify his conclusions, which his clear language so admirably sets before the reader.

Much of this book is necessarily a restatement of facts now generally accepted: this is true especially of the part devoted to the motor centres. In the remaining part a few points are especially noteworthy.

The author does not recede from his original position that the angular gyrus is the cortical centre for vision, although he enlarges the limits of the centre to include portions of the occipital lobe. Thus he speaks of the "occipito-angular region" as the visual area of the cortex. Complete destruction of this area in one hemisphere, he says, causes permanent hemianopsia to the opposite side by paralysis of the corresponding halves of both retinæ, while bilateral destruction causes complete and enduring blindness of both eyes. Again, he says, the angular gyri are more particularly the centres for clear vision, each mainly for the eye of the opposite side. Hemianopsia accompanying cortical lesions of the occipital lobe proper, he thinks, is due probably to direct or indirect implication of the optic radiations. The opinion of Seguin and Nothnagel that the cuneus, or the apex of the occipital lobe, has a special relation to visual perception is not supported, Dr. Ferrier thinks, by experimental research. The apparent relation between lesions of the cuneus and hemianopsia is due to the special proclivity of this region to affection by morbid vascular conditions, and to coincident implications of the optic radiations of the occipito-temporal region. All these statements are clear and unequivocal, and the whole subject is elaborated at great length. As it is of great clinical importance it is much to be desired that experimenters should agree upon such a vital question. To be told that the cuneus has no connection with vision will disturb the acquired knowledge of many clinicians.

Dr. Ferrier gives the details of recent experiments to determine the auditory centre. His description of the actions of a dog-faced monkey in which he had excised the superior temporal gyrus on both sides is very graphic and conclusive as to the localization of hearing in this convolution. The facts of human pathology, the author thinks, undoubtedly support the view that the sense of hearing is localized in the temporal lobe, and more especially in the superior gyrus. Space does not permit an examination here of the claims to a localization of the tactile centre and of the centres for taste and smell.

The author gives due credit to the experiments of Horsley and Schäfer which demonstrate that the marginal convolution (the mesial aspect of the brain) presides over the trunk and hip muscles. It is noted, however, that to paralyze these muscles completely, which are bilaterally coördinated in this convolution, it is necessary to extirpate the centres of both hemispheres. This fact may be of some practical importance to the surgeon. For instance, the advisability of a cortical operation for obstinate torticollis was discussed recently in the Philadelphia Neurological Society. The question presents itself whether or not the muscles involved in torticollis are bilaterally coördinated—*i. e.*, whether it would be necessary to remove the centre in both hemispheres? Dr. Ferrier's experiments do not appear to show this bilateral innervation. On the other hand, however, he says that there is reason for believing that the lateral movements of the head (and eyes) are not capable of being permanently paralyzed unless every portion of the frontal region be completely destroyed—a very heroic operation on man.

Dr. Ferrier is very positive that no form of sensation is localized in the motor cortex, and marshals a great array of facts, especially from recent autopsies and surgical cases, to support his position.

In conclusion, we are tempted to ask, Is the brain, after all, nothing but a sensori-motor ganglion? Are the rudiments of every idea a *sensation* and a *reflection;* has every psychic act a sensory and a motor aspect? This was practically the position of Locke, the greatest, most scientific English psychologist. Is he to be verified, even if only in part, by the experiments of the modern brain physiologists?

J. H. L.

Sterility in Women, including its Causation and Treatment. By Arthur W. Edis, M.D. Lond., F.R.C.P., Senior Physician to the Chelsea Hospital for Women; Late Obstetric Physician to the Middlesex Hospital, etc. Pp. 112. With thirty-three illustrations. London: H. K. Lewis, 1890.

As the author states in the preface, this monograph is simply a chapter from his former work on diseases of women, with some changes and additions, the latter being principally in the form of clinical histories. We confess that it is not easy to discover the *raison d'être* of the book, since the writer had nothing new to say and has not in publishing it added to his deserved reputation. The student does not need another monograph on this subject; the general practitioner will find it amply covered by Reeves Jackson's article in the *American System of Gynecology;* while for the specialist it is as elementary as it is antique. So much careful work has been done in this direction since the appearance of Sims's classic, that we are surprised to find that the writer has either overlooked or is not familiar with the recent French and German *brochures.*

In the introductory paragraphs attention is called to the possibility of sterility in the male. Too little stress is laid upon this point. The student should be taught that neither can the real cause of an unfruitful marriage be ascertained, nor can any truthful prognosis be given as to the results of local treatment until it is positively determined that the husband is not the guilty party. Injustice is constantly done to innocent women. Who will shield them from undeserved reproach, if not their physicians, who alone are in a position to learn the truth? Among the causes of sterility we notice that prevention of conception during the early years of marriage has not been mentioned. The family physician is a potent agent in the "prophylaxis" of sterility (if we may so term it) if he will only lay aside his mistaken notions of propriety and handle this delicate subject without gloves. Many women have occasion to repent bitterly their successful efforts to prevent conception soon after marriage, resorted to in ignorance of their harmfulness. Altogether too much stress has been laid upon anteflexion as a cause of sterility; we are too apt to grasp at this in the absence of definite knowledge. Who can pretend to say just what degree of contraction of the canal is sufficient to prevent the ingress of spermatozoa?

The operation of divulsion for stenosis of the os internum is touched upon briefly in comparison with the attention given to incision. "In contrasting the results obtained by division of the cervix with dilatation by tents," we read, "the former method seems to be attended by less [?] risks." We marvel at finding that posterior section is still taught as a safe method of treating cervical anteflexion, an operation which has been almost entirely abandoned in this country. Surely some attention should be called to the fact, so clearly demonstrated by Wylie, that it is the complicating endometritis which should receive treatment as much as, or more than, the original flexion.

Confusion is introduced by discussing retroversion and retroflexion under separate sections. How often do we meet with a pure retroversion, considered from a strictly anatomical standpoint? The treatment of fixation of the retro-displaced uterus, the most common and important of these conditions, is passed over in silence.

The closing section bears the obsolete title, "Granular Degeneration of the Cervix Uteri." When we add that the author suggests no new line of treatment, but only the old-fashioned local applications—caustics, etc.—we have given the reader a sufficient idea of its scope.

With all due respect to his high reputation, we can only repeat what we said at the outset, that a man who has written an excellent work on gynecology, eight or ten years ago, does not follow the wisest course in publishing a separate chapter from the same in the form of a monograph, especially if the latter shows decided evidences of the fact that he has failed to recognize the enormous strides which have been made in this department of medicine during the past decade. The medical public at the present day has a right to expect in a monograph either originality or judicious and exhaustive compilation, both of which elements are wanting in the present volume. H. C. C.

A DICTIONARY OF PRACTICAL MEDICINE. Edited by J. K. FOWLER, A.M., M.D. London, 1890.

THE editor of this dictionary, and the contributors thereto, are to be congratulated upon having been able to present, in these days of many-volumed treatises on medicine, so much real information concerning the subjects belonging to practical medicine within the moderate compass of a single octavo volume of less than a thousand pages. The dictionary contains upward of six hundred articles, most of them brief, but many of those upon the more important subjects fairly complete.

Among the more noteworthy articles may be mentioned: "The Diagnosis of Abdominal Tumors," "Acromegaly," "Albuminuria," "Bright's

Disease," "Fever," "Microörganisms," "Localization of the Lesions of Phthisis," and the numerous contributions upon diseases of the skin.

In discussing the prognosis of the various forms of albuminuria, Maguire expresses the opinion that "albuminuria, even when undoubtedly of functional origin, should always be considered as a diseased condition," and regards it as predisposing to attacks of acute Bright's disease. For the detection of albumin in the urine, preference is expressed for the magnesium nitric test of Sir William Roberts, because of its greater delicacy. We cannot agree with this author (Maguire) in the statement that cold is the most frequent cause of acute Bright's disease. On the contrary, we believe that the number of cases which arise from exposure must be small in comparison with those occurring as a sequel or complication of the specific fevers.

Fever (pyrexia) is defined by MacAlister as "a certain disorder of the body-heat, *usually* characterized by a rise of temperature." Can there be fever without a rise of temperature?

Mr. Victor Horsley, who contributes an article upon "Hydrophobia," accepts unreservedly the efficacy of the anti-rabic inoculations of Pasteur. While it is greatly to be desired that future investigations shall confirm the claims of those who advocate these inoculations, we do not think the question of their value is to be regarded as yet definitely decided.

We notice with pleasure a brief, but satisfactory, account of psorospermia, by Sutton. As yet, but little or nothing is to be found in the various text-books upon medicine concerning this subject, which is one of growing importance. Within the past few years, several cases of psorospermosis in man have been reported; and recent observations have suggested the probability that certain epithelial proliferations, as molluscum contagiosum, are due to psorospermial infection. Indeed, some recent French writers claim that Paget's disease is a cutaneous psorospermosis.

In the treatment of peritonitis, Williams adheres to the use of opium, no mention being made of the use of saline laxatives, which have recently been so much vaunted by some writers.

The editor contributes an article on the "Localization of the Lesions of Phthisis," in which he discusses the subject at some length. He endeavors to show that "the disease in its onward progress through the lungs, in the majority of cases, follows a distinct route, from which it is only turned aside by the introduction of some disturbing element," and he would make this fact of much importance in diagnosis and prognosis.

The various articles on diseases of the skin, which are written by Pringle, are exceedingly well done and contain much valuable information concisely and clearly presented.

Other articles of excellent quality might be mentioned, but want of space forbids their consideration.

In a few instances, it has seemed to us, an undue amount of space has been given to the discussion of unimportant subjects. As an example, an entire page is devoted to "Yawning," which, while interesting, perhaps, from a purely scientific point of view, can scarcely be regarded as of much practical importance. On the other hand, the subject of "Dyspnœa" is dismissed with less than a dozen lines.

Not the least valuable feature of this book is the thoroughness with which the various authors, as a rule, have incorporated in their contributions the most recent discoveries in the various departments of medicine. Upon the whole, the dictionary may be said to be thoroughly up to date, and may be recommended to those who wish concise information upon the newest additions to medical knowledge. M. B. H.

STRICTURE OF THE RECTUM: A STUDY OF NINETY-SIX CASES. By CHARLES B. KELSEY, M.D. New York, 1890.

THE pamphlet before us contains the results of the author's experience in the treatment of stricture of the rectum. It is essentially a practical treatise, and is useful for this reason. After discussing the classification, symptoms, and diagnosis of stricture of the rectum, the author proceeds to a consideration of the methods of treatment. Dilatation, either alone or in connection with incision, is recommended as one of the most reliable agents in the treatment of this disease. The author very properly condemns the use of violence in practising dilatation; a bougie which is large enough to cause pain by stretching is always too large to do anything but harm. He advises the use of the soft-rubber bougie; a size being selected which will pass through the stricture without force and which may be left in place for several hours without causing uneasiness.

The treatment by incision, or external posterior linear proctotomy, is advocated in cases which cannot be cured by simple dilatation, and which are not caused by malignant disease. Out of the seventeen cases of proctotomy tabulated there were two deaths—both of which were cases of malignant stricture. We agree with the author's statement that neither theoretically nor from practical experience can the operation of proctotomy be recommended in malignant disease.

The treatment of electrolysis is dismissed with a few words. Electrolysis reduced to fact means, in the treatment of stricture of the rectum, either simple dilatation or the application of the cautery. The olive-pointed electrodes, placed against a stricture and gently pressed inward for ten or fifteen minutes, will cause exactly the same amount of dilatation and absorption whether the elaborate battery be connected with them or not.

The operation of excision is discussed and the technique of the operation is described. The operation should be performed as quickly as possible, bleeding being disregarded or controlled by sponge pressure until the whole diseased mass has been removed. The secret of success in extirpation of the rectum is to remove the disease as speedily as possible, and to control the bleeding by pressure during the operation and afterward until ligatures can be applied. The author states that in all his experience he has never seen a case of hæmorrhage which could not be controlled by direct pressure. There is a superstitious fear of hæmorrhage in the minds of men who have had but little experience in rectal surgery.

Colotomy is urged in suitable cases; the inguinal being preferred to the lumbar operation. As regards ease and certainty of performance, the subsequent cleanliness of the patient, and the ability to care for the opening, all the advantages are in favor of the inguinal operation. The dangers of the two operations are about the same.

In describing the operation of inguinal colotomy the author makes two valuable suggestions. Before the selected portion of colon is attached to the parietes, it is drawn downward till it is held firmly by the mesentery above, and is then fastened to the edges of the wound in this position. This proceeding prevents prolapse of the mucous membrane from the upper segment, a sequel which has never followed in any of the author's cases.

The second suggestion is to use a harelip pin as the first step in fastening the gut to the abdominal wound. The pin is passed through the parietes and through the mesentery of the gut, thus firmly securing it so that it cannot be displaced should straining occur under the anæsthetic or after. Again, it insures the formation of a sharp spur in the posterior wall of the gut.

The pamphlet concludes with a table of operations: proctotomy, colotomy, and excision. C. B. P.

ON THE TREATMENT OF DISEASES OF THE NERVOUS SYSTEM. By C. W. SUCKLING, M.D. (Lond.), M.R.C.P.; Professor of Materia Medica and Therapeutics at the Queen's Hospital; Extra Acting Physician to the Children's Hospital; Physician to the Workhouse Infirmary; and Consulting Physician to the Orthopædic and Spinal Hospital, Birmingham. 8vo., pp. 278. London: H. K. Lewis, 1890.

As the preface indicates, this little volume was prepared to serve as a complement to the author's earlier work on the *Diagnosis of Diseases of the Brain, Spinal Cord, and Nerves.* Dr. Suckling states his aim has been to render it a short and practical handbook of treatment. We think he has succeeded admirably. The diseases are arranged alphabetically; a concise definition precedes the outlined treatment in each instance where the name of the malady does not clearly define itself, and in many of the sections points of much value in diagnosis are interspersed. Indeed, in some of them semeiology is quite elaborately considered; that, for instance, on "Syphilis of the Nervous System" contains no less than seven pages devoted to the discussion of diagnosis, forming an excellent guide to the recognition of its various phases. When the size of the book, and the large number of subjects handled, are considered, it is surprising how completely yet concisely most of them are disposed of. In few instances does anything of importance seem omitted. Thus, though the chapter on "Convulsions" occupies less than three pages, it would be difficult to find anywhere in such brief compass so much valuable data as to diagnosis and treatment. It is of interest to note that the author here does not neglect to mention lead as a cause of eclampsia, and advises an inspection of the gums in cases of convulsions the origin of which is obscure—a point not often found in large treatises on diseases of the nervous system.

Amyl nitrite by inhalation is justly regarded as a valuable remedy in the paroxysm of angina pectoris where the blood-pressure is raised, but a much larger quantity may be required to influence the increased tension than the limit named—five minims. Ten, or even fifteen, minims rapidly inhaled will often succeed in aborting the paroxysm of angina or of epilepsy, when a less quantity will be inoperative. Here, too, nitro-glycerin in the small dose advised will be found of trifling service unless administered *for effect* in increasing quantities. The dose of the latter is indicated as one minim of the one per cent. solution, and, in the posological table appended to the book, from one-half to two minims, no intimation being made of the necessity of the amount prescribed being regulated by the effect produced. As a rule, unless certain characteristic subjective symptoms follow its ingestion, the quantity administered is too small to be efficient. Tolerance is usually acquired so rapidly that the dose has to be steadily increased for its influence to be maintained.

We think the author shows singular freedom from insular prejudice in considering exophthalmic goitre under *B*, thereby placing Basedow's name before Graves's, and omitting the latter's altogether in the heading on the second page containing the outline of treatment of this disease. This, though probably an oversight, we cannot but regard as a trifle unjust to the memory of Graves, who, as is well known, fully described exophthalmic goitre five years before Basedow. The system of cognominal nomenclature of disease is not to be encouraged, but it is certainly desirable that where it cannot be avoided, credit be placed where it is due.

In the treatment of chronic hydrocephalus, following Gowers, the author advises that not more than an ounce of fluid be removed at a time. Unlike Gowers, however, Suckling believes that there is not much danger attending the operation. We entirely concur with him regarding freedom from risk, even when a much larger quantity is withdrawn. The smaller amount is, perhaps, all that should be removed in the first aspiration, or in subsequent ones, in cases where, the sutures having united, proper compression of the head, during and subsequent to tapping, cannot be applied. Practical experience and acquaintance with the literature of the subject permit us to assert that in suitable cases many ounces may be withdrawn entirely without risk, and with decided temporary benefit.

Suckling places a high value on chloralamide in insomnia, believing it to be the safest and most reliable of the hypnotics recently introduced. He considers sulphonal very uncertain in its effects, and regards paraldehyde as safe, but also uncertain. There is no doubt that sulphonal, as ordinarily prescribed, is uncertain, and that, however administered, it may cause disagreeable after-effects; but the same cannot be said of paraldehyde, which, in spite of its unpleasant odor and taste, still holds first place as a prompt and trustworthy sleep-producer.

It is stated that ophthalmoplegia interna is caused by syphilis, locomotor ataxia, diphtheria, and multiple sclerosis. It might have been well to add that many intra-ocular conditions may also originate it, such as glaucoma and various intra-ocular inflammations. It is one of the initial symptoms of sympathetic ophthalmia.

Regarding suspension in locomotor ataxia, the author holds the opinion now generally accepted by those who have given it a fair trial, that although it has in no case effected a cure, and often fails in affording relief, it may still be regarded as a most useful supplement to our armamentarium in the treatment of this disease. D. D. S.

PROGRESS

OF

MEDICAL SCIENCE.

THERAPEUTICS.

UNDER THE CHARGE OF

FRANCIS H. WILLIAMS, M.D.,

ASSISTANT PROFESSOR OF THERAPEUTICS IN HARVARD UNIVERSITY.

KOCH'S TREATMENT OF TUBERCULOSIS.

THE researches of PROFESSOR KOCH will prove to be of such great importance that an outline of what has thus far been published may well be considered at this time. Since the announcement, at the International Medical Congress last summer, that he had found a remedy which conferred upon the animals experimented on an immunity against inoculation with the bacillus of tuberculosis, and which arrested tuberculous disease, Professor Koch gave out in November a most important communication, which was published in many medical journals and in the newspapers.

The composition of the proposed remedy has just been disclosed—a glycerin extract of the tubercle bacilli. The brownish, transparent liquid which is used does not require special care to prevent its decomposition. When it is used it must be dilued, and these diluted solutions should not be kept, as bacterial growths soon develop inthem, and they are then unfit for use.

Introduced into the stomach the remedy has no effect; it must be used subcutaneously, and every precaution must be taken to keep the syringe used perfectly clean. The most suitable site for the injection is the skin of the back between the shoulder-blades and the lumbar region. Here the injection leads to the least local reaction, and is almost painless.

The action of the remedy on man and on guinea-pigs is widely different Calculated by body-weight, one-fifteenth-thousandth part of the quantity which has no appreciable effect on the guinea-pig acts powerfully on the human being.

After injecting four minims into his own upper arm, Professor Koch had pain in the limbs, fatigue, inclination to cough, difficulty of breathing, three or four hours after the injection. These symptoms rapidly increased during the fifth hour, and were unusually violent. A chill followed, which lasted almost an hour, at the same time there were nausea, vomiting, and a rise of temperature to 103°. After twelve hours all of these symptoms abated; the temperature fell, and on the next day it was normal. A feeling of fatigue and pain in the limbs continued for a few days, and for the same period the site of the injection remained slightly painful and red. The smallest quantity of the remedy which will affect the healthy human being is about 0.14 minim (0.01 c. c.), or 1 c. c. of the one-hundredth dilution. This amount in most people causes slight pains in the limbs and transient fatigue. A few showed a rise of temperature to about 100.4°. The same holds good with regard to patients suffering from diseases other than tuberculosis; but the case is very different when the disease is tuberculosis, when such a dose, injected subcutaneously, causes a severe general reaction as well as a local one. The general reaction consists in an attack of fever, which usually begins with rigors, and raises the temperature above 102.2°, often to 104° and even 105.8°, accompanied by pain in the limbs, coughing, great fatigue, and often sickness and vomiting. In several cases a slight icteroid discoloration was observed, and occasionally an eruption like measles on the chest and neck. The attack usually begins four or five hours after the injection, and lasts from twelve to fifteen hours. Occasionally it begins later, and then runs its course with less intensity. The patients are very little affected by the attack, and as soon as it is over feel comparatively well.

The local reaction is best observed in cases in which the tuberculous affection is visible; for instance, in cases of lupus, changes take place which show the specific anti-tuberculous action of the remedy to a most surprising degree. A few hours after an injection into the skin of the back—that is, in a spot far removed from the diseased area on the face or elsewhere—the lupus begins to swell and to redden, and this it does generally before the initial rigor. During the fever the swelling and redness increase, and may finally reach a high degree, so that the lupus-tissue becomes brownish and necrotic in places where the growth was sharply defined. One sometimes found a much swollen and brownish spot surrounded by a whitish edge almost one centimetre wide, which again was surrounded by a broad band of bright red. After the subsidence of the fever the swelling of the lupus-tissue gradually decreases and disappears in about two or three days. The lupus-spots themselves are then covered by a soft deposit, which filters outward and dries in the air. The growth then changes to a crust, which falls off after two or three weeks, and which—sometimes after only one injection—leaves a clean, red cicatrix behind. Generally, however, several injections are required for the complete removal of the lupus-tissue. The changes described are exactly confined to the parts of the skin affected with lupus. Even the smallest nodules and those most deeply hidden in the lupus-tissue go through the process and become visible in consequence of the swelling and change in color, whilst the tissue itself in which the lupus-changes have entirely ceased remains unchanged. The observation of a case of lupus treated by the remedy is so instructive, and is necessarily so convincing, that those who wish to make a trial of the remedy should begin with a case of lupus.

The reaction of the internal organs, especially of the lungs, is not at once apparent, unless the increased cough and expectoration of consumptive patients, after the first injections, be considered as pointing to a local reaction in these cases; the general reaction is dominant, but we are justified in assuming that changes similar to those seen in lupus also take place. The remedy will form an indispensable aid to the diagnosis of tuberculous processes, and with its aid we shall be able to make a diagnosis in doubtful cases of phthisis where it is impossible to obtain certainty as to the nature of the disease by the discovery of bacilli or elastic fibres in the sputum, or by physical examination. Affections of the glands, latent tuberculosis of the bone, doubtful cases of tuberculosis of the skin, and similar cases, will be recognized. In cases of tuberculosis of the lungs or joints which have been apparently cured, we shall be able to make sure whether the disease has really finished its course, and whether there be still some diseased spots from which it might again arise as a flame from a spark hidden by ashes.

In lupus its action seems to be curative, but in what way it occurs cannot as yet be stated with certainty, as the necessary histological investigations are not complete. It is, however, certain that it does not destroy the tubercle bacilli in the tissues, but only that the tissue inclosing the tubercle bacilli is affected by the remedy. It can influence living tuberculous tissue only, and has no effect on dead tissue, as, for instance, necrotic cheesy masses, necrotic bones, etc., nor has it any effect on tissues made necrotic by the remedy itself. In such masses of dead tissue living tubercle bacilli may possibly still be present, and are either thrown off with the necrosed tissue, or may possibly enter the neighboring and still living tissue under certain circumstances in the therapeutic activity. If the remedy is to be rendered as fruitful as possible, the peculiarity in its mode of action must be carefully observed. At first the living tuberculous tissue must be caused to undergo necrosis, and then everything must be done to remove the dead tissue as soon as possible, as, for instance, by surgical interference. Where this is not possible, and where the organism is unassisted in throwing off the tissue slowly, the endangered living tissue must be protected from fresh incursions of the parasites by continuous application of the remedy.

The fact that the remedy makes tuberculous tissue necrotic and acts only on the living tissue, helps to explain another peculiar characteristic, namely, that it can be given in rapidly-increasing doses, in the course of three weeks to five hundred times the original amount. It is probable that in the beginning of the treatment there is a good deal of tuberculous living tissue, and that consequently a small amount of the active principle suffices to cause a strong reaction, but by each injection a certain amount of the tissue capable of reacting disappears, and then larger doses are necessary to produce the same amount of reaction as before. So soon as the point is reached at which reaction is as feeble as that of a non-tuberculous patient, then it may be assumed that all tuberculous tissue is destroyed. Then the treatment will only have to be continued by slowly-increasing doses and with interruptions, in order that the patient may be protected from fresh infections while bacilli are still present in the system; whether this conception and the inference drawn from it be correct the future must show.

In nearly every case of lupus the treatment was as follows: The full dose of 0.01 c. c. was injected, the reaction was allowed to come to an end, and then after a week or two the same amount was injected, continuing in the same way until the reaction became weaker and weaker, and finally ceased.

In two cases of facial lupus the lupus-spots were thus brought to complete cicatrization by three or four injections, the other lupus cases improved in proportion to the duration of the treatment; all of these patients had been sufferers for many years, having been previously treated unsuccessfully by various therapeutic methods.

Glandular, bone, and joint tuberculosis were similarly treated by large doses at long intervals. The result was the same as in the lupus cases, namely, a speedy cure in recent and slight cases; slow improvement in severe cases.

With phthisical subjects, who made up the largest number of the patients, the conditions were somewhat different. Those with decided pulmonary tuberculosis are much more sensitive to the remedy than those with surgical tuberculous affections. For them it was found necessary to diminish the dose, as they almost all reacted strongly to 0.002 or even 0.001 cubic centimetre; from this small dose it was possible to rise more or less quickly to the amount that is well borne by other patients.

An injection of 0.001 c. c. was first given to the phthisical patient, and from this a rise of temperature followed; the same dose was repeated once a day until no reaction could be observed. This dose was then increased to 0.002 c. c. until this was borne without reaction, and so on, increasing by 0.001 or at most 0.002 to 0.005 c. c. This mild course seemed to be imperative in cases in which there was great debility. By this mode of treatment the patient can be brought to tolerate large doses of the remedy with scarcely a rise of temperature. But patients of greater strength were treated from the first partly with large doses and partly with frequently-repeated doses. Here it seemed that the beneficial results were more quickly obtained.

The action of the remedy in cases of phthisis generally showed itself as follows: Cough and expectoration were generally increased a little after the first injection, then grew less and less, and in the most favorable cases entirely disappeared. The expectoration lost its purulent character and became mucous. As a rule, the number of bacilli decreased only when the expectoration began to present a mucous appearance. They then entirely disappeared, but were again observed occasionally until expectoration completely ceased. Simultaneously the night-sweats ceased, the patient's appearance improved, and he increased in weight within from four to six weeks.

Patients under treatment for the first stage of phthisis were freed from every symptom of disease and might be pronounced cured; patients with cavities not yet too highly developed improved considerably and were almost cured, and only in those whose lungs contained many large cavities could no improvement be shown. Objectively, even in these cases the expectoration decreased and the subjective condition improved. These experiences lead one to suppose that phthisis, in the beginning, can be cured with certainty by this remedy. This statement requires limitation, in so far as at present no conclusive experiences can possibly be brought forward to prove whether the cure is lasting.

Relapses may occur, but it can be assumed that they may be cured as easily and quickly as the first attack; it is possible that patients once cured may retain their immunity. Patients with large cavities will probably obtain lasting benefit only in exceptional cases. Possibly some of these severely-afflicted patients may be relieved by a combination of this new therapeutic method with surgical operation, such as the operation for empyæma. The treatment will probably be quite simple in cases in which the beginning of phthisis and simple surgical cases are concerned, but in all other forms of tuberculosis medical art must have full sway by careful individualization and making use of all other auxiliary methods to assist the action of the remedy.

In many cases the decided impression was created that the careful nursing bestowed on the patient had considerable influence on the result of the treatment, and Professor Koch is in favor of applying the remedy in proper sanataria, as opposed to treatment at home and in the out-patient room. How far the methods of treatment already recognized as curative, such as mountain climate, fresh air, special diet, etc., may be profitably combined with the new treatment cannot yet be definitely stated, but Professor Koch believes that these therapeutic methods will also be highly advantageous when combined with the new treatment.

The most important point to be observed in the new treatment is its early application. The proper subjects for treatment are patients in the initial stage of phthisis.

In the Charité Hospital in Berlin, Professor Fräntzel and Dr. Runkwitz have carried out Koch's treatment systematically, since September 13th, with Dr. Pfuhl's assistance. The new remedy was tried chiefly upon patients with phthisis, and, for purposes of comparison, upon patients whose lungs were healthy. Upon the healthy class small doses caused no reaction, but large ones were followed by a temperature of 102.2°, rigors, pains in the limbs, and exhaustion. In one case symptoms were caused which suggested the possibility of latent tuberculosis. The phthisical cases were of two classes, those in which the disease had made much progress, and those in which the progress was less marked. In four cases of the first class the progress of the disease was not stopped, in two of the cases no signs of healing were found after death. In eight cases, when the progress of the disease was less marked, the results were more satisfactory. One will suffice to suggest the general character of these cases.

A locksmith, twenty-one years old, of healthy family. In 1889, had swollen and discharging glands in the neck. Since May, expectoration and cough; from September 30th until October 3d, the expectoration was bloody. A tall man, of average development, with a flat thorax. Dulness in front on the right side to the second rib, behind dulness in the right supra-spinous fossa. Numerous râles over the right lung. The abundant bloody expectoration contained bacilli No. 6, counted according to Gaffky's method. Left lung free. After thirty-five days of treatment, the dulness on the right side was still to be recognized, râles few in number, but only found after coughing. No more blood expectorated; expectoration less and vitreous in character. No more night-sweats. Bacilli disappeared. Increase in weight one and a quarter pounds.

In the lighter forms of the disease the bacilli disappear for the time at least. The physical signs improve, the secretion is less, fever disappears, night-sweats cease, the cough is reduced to a minimum, the appetite is good, and the body increases in weight. Obviously the method is one which will be of most service when applied early in the disease, and where there is not a large amount of material to be disposed of. For the conditions in the lung are not so simple as in lupus, for example, where the infiltrated tissue is readily thrown off. In the lungs the tuberculous tissue is killed, but it remains in the lungs, perhaps imbedded in cheesy material; in any case its expectoration is often very difficult. When these masses of tissue remain in the lungs they are a source of danger and a menace to the patient's life, for they contain bacteria which will renew their attack upon the system so soon as the treatment is stopped. This accounts for the fact that some patients who had ceased to react to the remedy, again reacted after an interval during which the treatment had been suspended. It will, therefore, be necessary to have patients under treatment for some time, and afterward at intervals test their immunity from a reaction to Koch's remedy.

In the out-patient department of the Charité Hospital in Berlin, Dr. Köhler and Dr. Westphal treated twelve cases of tuberculosis, including lupus and tuberculous affections of joints. The patients received injections of a one-per-cent. dilution of the remedy, beginning with a 1.6 ♏ (0.1 c. c.), which in some cases was gradually increased to 16 ♏ (1 c. c.). The syringe should be disinfected with absolute alcohol after each injection. The technique of the injection does not differ from that of giving an ordinary subcutaneous injection. As a rule, the injection is almost painless, and is accompanied by only slight local reaction. The usual general symptoms came on about six hours after the injection. From the time of the injection until the chill the patient had no discomfort, but with the chill there were headache, pains in the limbs and in the back, which disappeared as a rule on the next day. Some of the patients had with the chill considerable pain in the stomach and vomiting; with others these symptoms came on near evening, when the temperature was at its height, and disappeared with its subsidence.

While all tuberculous patients do not react in the same manner to the remedy, it is true that tuberculous patients are more susceptible to the action than non-tuberculous patients, the same dose being given in both cases. Most tuberculous patients have a chill after six hours, followed by fever, sometimes with a temperature up to 104°, which usually became normal within twenty-four hours. The pulse was increased during the fever up to 130–140 per minute. In some cases an exanthematous eruption, in others icterus, was observed.

The local appearances are most striking in lupus; in one patient who had lupus nasi a feeling of warmth, burning, and tension came on in two hours after the injection; three hours later the face was red; after five hours the parts affected had reached their maximum condition of swelling and redness. The swelling and redness were not limited to the diseased parts, but included neighboring parts. The affected parts, nose and upper lip, were also covered with an exudation in the form of yellow drops and crusts. Though the swelling and redness did not increase until the next day, the scabs were more numerous and thicker. The exudation did not appear to continue more than forty-eight hours. After two days the redness and swelling of the diseased spots and their vicinity began to diminish, and was limited, after five days, to the affected places, and even these became much paler in the following three weeks.

Five days after the injection the scabs began to crumble, and on the ninth day could be removed easily. The nose was found to be no longer swollen, but smooth and pale-red over most of its surface, and was covered, as the other affected parts, with a delicate cicatrix. On the alæ nasi and their borders, as well as the nostrils, there were pale granulations, which were again covered with a scab within a few days, and they had fully cicatrized on the twenty-fourth day. On the fifteenth day there appeared on the smooth surface of the nose numerous soft red prominences about the size of a pin's head, often with a small blister, between them there remained the pale-red new cicatrix. The number of these small knobs and blisters increased to the day of the next injection. The injections were repeated after the twenty-seventh day three times, with intervals of two and one day. After each injection there appeared on that day swelling, redness, and exudation, but not with such intensity as after the first injection.

The total amount injected into this patient was a drachm of the one-per-cent. solution. In four cases patients who had old scars or wounds were chosen because they had no signs of tuberculosis, and to test the reaction of the remedy in such cases. No local changes in the wounds or scars were observed, but it was found that the remedy can cause general symptoms in non-tuberculous patients.—*Deutsche medicinische Wochenschrift*, November 4, December, 1890.

At the instance of Professor Gerhardt Dr. Hertel treated eighteen cases who had tuberculous affections of the larynx. The one-per-cent. solution, preserved with one-half per cent. of carbolic acid, was employed. At the site of the injection there was no special irritation.

In fourteen cases bacilli were found in the expectoration; in three others the tuberculous nature of the laryngeal disease was confirmed by the presence of lupus or physical signs in the lungs. In one the injection was made as a test.

The cases included four groups: First, those in whom, before the treatment, no signs of disease of the larynx were visible, but which became apparent after the injections. Second, patients who had what seemed to be disease of a tuberculous nature in the larynx, and which changed its appearance under the treatment. Third, such as suffered from undoubted tuberculous disease of the larynx; and fourth, two patients who had scarcely any general reaction from the remedy, and no local reaction in the larynx.

The experience of the few weeks' observation of these cases is as follows: The treatment renders the diseased spots more conspicuous. After a few milligrammes ($\frac{1}{64}$ grain) there appears, after a longer or shorter interval, a local reaction, sometimes accompanied by a general reaction, and sometimes without. The local reaction consists of a reddening and swelling of the diseased tissues, which changes its color in about twenty-four hours. Later a funnel-shaped ulcer forms in the middle of the diseased tissue. The diseased tissue shrinks, while there is greater or less discharge of mucus and liquid. Up to November 27th time enough for a cure had not elapsed, but the improvement has been continuous.

V. Bergmann, by permission of Dr. Koch, presented patients, and described the treatment received by them in his clinic.

The cases treated are divided into four classes:

1. Thirteen cases of tuberculosis of the skin, including tuberculosis of the pharynx.
2. Four cases of tuberculosis of the lymph glands of the neck.
3. Sixteen cases of tuberculosis of the joints and bones.
4. Four cases of tuberculosis of the larynx.

The difficulty of differentiating between carcinoma and tuberculosis will be obviated by Koch's remedy, and the diagnosis will be positive. A better illustration of its value in this respect can scarcely be found than is afforded by these cases.

They demonstrate the fact that the subcutaneous application of Koch's remedy in those organs attacked by the tubercle bacillus, viz., the skin, mucous membrane, lymph glands, joints, and bones, produces changes which are manifest in the swelling, reddening, increase of sensibility, and disturbed functions. These phenomena do not occur in other than tuberculous tissues —such as syphilis and carcinoma—or in healthy individuals. There is no remedy which produces an action analogous to this. This fact alone is enough to arouse the greatest interest, and to render it of great therapeutical value. Through the medium of the blood the diseased spot is influenced in a visible and positive manner. The local action is associated with a high fever, producing a rapid rise of temperature, rapid pulse, icterous discoloration of the skin, headache, nausea, vomiting, pains in the limbs, exhaustion, weakness. These are the first effects of Koch's remedy.

These cases undoubtedly show, especially the patients with lupus and a child with coxitis, that the tuberculous tissues degenerate under the influence of the remedy.

The tuberculous ulcer on the alveolar process and hard palate is in process of cicatrization, one of the lupus cases is almost entirely cured, and the second case, Wachter, has lost most of the nodules, and her improvement is evident. The coxitis of Ziegelsdorf of a few weeks' duration has lost its sensitiveness, increased mobility, the swelling is hardly perceptible, and the formerly-flexed leg has been straightened without producing pain.

From all accounts the remedy should be used only in small (1 mg., $\frac{1}{64}$ ♏) doses where there is much tuberculous tissue present, and only when the site of the disease is external, or when after using small doses it is found desirable to increase the dose, should large ones be employed (in children $\frac{1}{2}$ mg. or $\frac{1}{128}$ ♏).

For use, one part of the remedy may be diluted with 99 parts of $\frac{1}{2}$ per cent. carbolic acid solution. One cubic centimetre of this solution would contain 0.010 or ten doses of 1 mg. each. This may again be diluted by taking one part of it and adding 9 parts of water, which would give (one part of the original liquid in 1000 of solution) 1 mg. in each cubic centimetre—a cubic centimetre is equivalent to ♏ xvj, or exactly ♏ xvj = 0.99 c. c. The injections are usually made by means of a special syringe which can be easily kept clean by washing in absolute alcohol and rinsing in water, though subcutaneous syringes of the ordinary pattern, but with asbestos packing in the piston, have been used.

[For the treatment of lupus and for purposes of diagnosis the remedy will probably be of value; in the treatment of tubercular diseases of the joints, in connection with surgical treatment, it seems likely to have a field of usefulness. Where the process has made little progress in the respiratory organs, there is reason to hope that we are to have a remedy better than anything thus far known, but great numbers of patients in advanced stages of consumption will be sadly disappointed.

In the treatment of tuberculous disease in animals it will probably lead to the saving of large sums, and as a prophylactic save human life by diminishing the chances of the spread of the disease to man.

Much criticism has been made about the delay in publishing the secret; but it is probably difficult to make the remedy of uniform strength and quality. The fluid is a violent poison, and carelessly-made preparations would soon bring the whole method into disrepute.

Professor Koch may feel well satisfied, not only with the results of his investigations thus far, but with the manner in which his statements have been received, for there is no one whose word commands more fully the confidence of the entire profession. Let the profession remember that the situation in which Professor Koch finds himself may be full of embarrassment, and before assuming that he has personally any ulterior motive for having withheld the secret of the preparation of his remedy, it is right to consider that in Germany his relations to his government may be such, and may since last summer have been such, as to compel him to do as he would not; in other words, his hand may have been forced from the beginning. Let us accord to Professor Koch none other than the highest, most generous, and humane motives.]

New Methods of Treating Erysipelas.

Rosenbach's method consists in washing not only the erysipelatous patch, but the entire neighboring surface, with soap and then bathing daily these patches with five-per-cent. solution of phenic acid dissolved in absolute alcohol. Very brilliant results are claimed to follow this method, both as regards the course of the disease and the febrile phenomena. Even absolute alcohol is said to produce a favorable action.

In Nolte's method the entire affected surface and surrounding zone are painted twice daily with a mucilage of gum-arabic containing from three to five per cent. of phenic acid.

The method of Koch consists in applying, by means of a camel's-hair pencil, the following ointment in a thin layer over the affected parts:

Creolin	1 part.
Iodoform	4 parts.
Lanolin	10 "

After the ointment is applied it is covered with a thin layer of gutta-percha. This method is said to be especially applicable to erysipelas of the face and of the hairy scalp.

In the method of treatment of Nussbaum and Brumm ichthyol is employed in collodion.

Hallopeau recommends the use of a solution of 1 part to 20 of salicylate of sodium. Thick cloths are wet with this solution, then applied to the affected parts, and then covered with a layer of rubber cloth so as to prevent evaporation. Almost immediate relief is obtained, and a cure is said to follow on the third to the fifth day.

Hunter recommends the injection of carbolic acid into the healthy skin at a distance from the part infected. This method of treatment is extremely painful, and is only applicable in severe cases of the face or hairy scalp.

Dr. Kraske advises making an incision in the healthy skin around the erysipelatous patch before applying the antiseptic substance.

Wölfler makes use of mechanical compression by bandages applied so as to circumscribe the inflamed tissue, while Dr. Kraske proposes elastic rubber bands to accomplish the same effect, where these are applicable.—*Therapeutic Gazette*, No. 10, 1890.

Whooping-cough.

Bromoform	gtt. x.
Alcohol	ʒj.
Distilled water	℥iij.
Syrup	ʒiij.—M.

Sig.—One or two teaspoonfuls daily.

—*Revue de Thérapeutique*, No. 17, 1890.

Salol Collodion.

It is recommended to dissolve four parts of salol in four parts of ether, and then add it to thirty parts of collodion.

It is said that the application of the salol collodion to the affected parts in acute rheumatism will be followed by rapid relief of pain.—*Therapeutic Gazette*, No. 8, 1890.

[If collodion is applied to a joint it is well not to have it go completely around the limb, as collodion contracts strongly on drying, and might cause too much constriction.—Ed.]

Death from a Large Dose of Paraldehyde.

Bridget O'B., twenty years old, was admitted to the fever hospital attached to the Cork Workhouse, suffering from typhoid fever. Through an oversight on the part of the attendant, she was probably given six or seven drachms of paraldehyde. In about five minutes she fell into an unconscious state, and, despite medical assistance, she died some hours later.—*Lancet*, August 20, 1890.

Aristol.

1. Aristol has been used in a pure state in sclerosis and other ulcerations in the male and female genitals. After washing the ulcers with carbolic or sublimate water, the aristol was powdered on and covered with gauze. In ulcers on the glans penis it is necessary to remove the bandage frequently on account of priapism; in these cases iodoform has the advantage over

aristol. In syphilitic and indolent ulcers or chancres the latter acts exceedingly well. Great cleanliness is necessary, especially about the female genitals. In fresh cases aristol has no advantages over iodoform.

2. Aristol was made use of with the best results in acute otitis media and otorrhœa in place of boracic acid, in lupus laryngis, laryngorrhœa, in ulcerations of the penis, and ulcers of the leg. In burns aristol (with oil or lanolin 10 per cent.) relieved pain, and caused rapid cure.

Aristol possesses the advantages of iodoform, and can even be used in children, with whom iodoform must be used carefully.

Aristol has not a penetrating odor like iodoform.

MEDICINE.

UNDER THE CHARGE OF

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THE PRINCIPLES OF THE TREATMENT OF DIABETES MELLITUS.

PAVY (*International Med. Congress*, 1890), referring to the nature of diabetes, says that it is with the carbohydrate principles that the faulty action lies. These, instead of being consumed and utilized, remain and are eliminated as carbohydrates. This is true, whether the carbohydrates are introduced in the food, or whether they are formed by the splitting-up of nitrogenous matters within the body.

With regard to the presence of sugar in ordinary urine, the author made a series of observations some years ago in which he definitely proved that it existed there in small quantities. He also found it normally present in the blood. A further series of observations made upon the blood of seven cases of diabetes showed that the amount of sugar in it was very greatly increased, and that there was a general agreement between the amount here and that escaping in the urine. The conclusion is, therefore, justified that the larger the secretion of sugar in the urine the worse in every direction is the condition of the patient suffering from diabetes; since the unnatural state of the blood cannot but induce a deviation from healthy action throughout the system.

The question arises as to the source of this abnormality of the blood. The long experience of the author, and the experiments carried out by him, convince him that it is due to sugar reaching the general circulation in a manner it ought not. In the normal condition the ingested carbohydrates are restrained by the liver from entering the general circulation. The author has proved this to be the case by analyzing the blood in the portal vein and that in the general circulation, and showing that a large preponderance of sugar is encountered in the former, if examined after the ingestion of carbohydrate matter. It is necessary, however, to bear in mind that this sugar here found is not in the form of glucose, and that an ordinary copper test can therefore not be depended upon to give accurate results.

These preliminary remarks show the nature of the faulty condition that has to be dealt with by treatment. If it were only a question of the waste of the carbohydrate principles of the food, there would be no reason against their being eaten and allowed to run off in the urine, provided sufficient other nourishment were given. The real harm is the result of the altered constitution of the blood, and the effects on the system in general which this alteration produces.

It may not be possible to restore the transformative or assimilative power which has been impaired or lost. Hence the only way of arriving at the desired end is to withhold from entering into the system the alimentary principles which lead to the passage of sugar through the circulation. These remarks apply to the class of cases embracing the majority of those beginning after middle life, in which the discharge of sugar is susceptible of control by treatment.

In the course of all the author's experience he has never known anything serious to arise as long as the urine was kept free from sugar. When, on the other hand, sugar is being voided, not only is the patient subjected to symptoms consequent thereon, but he is in constant danger of the supervention of more serious issues known to follow upon the disease.

The first consideration, therefore, is to control by dietetic measures the passage of sugar through the system. The real point, however, to be aimed at is the restoration of the assimilative power over the carbohydrate elements of the food. What most conduces to this restoration is the maintenance of a normal state of the system by keeping sugar from passing through it, and in this way bringing a healthy condition of the body to bear in helping to promote a removal of the faulty state.

Opium and its derivatives are, in the author's opinion, the medicinal agents which most assist in the actual cure of the disease and the restoration of the assimilative power. The benefit to be derived from these agents is often seen in cases in which mere dietetic treatment has reduced the sugar to a certain point, but fails to remove it entirely. When cases of a favorable nature are treated by these combined measures, the system of the patient frequently becomes finally able to tolerate a certain amount of carbohydrate food with benefit; but care must always be taken to keep the amount below that which produces an elimination of sugar in the urine.

When a case is found to have the assimilative power restored, it is permissible to call it *cured;* always remembering, however, that a weak point has existed which must not be unduly taxed.

ON THE INFLUENCE OF HUNGER ON THE SUSCEPTIBILITY TO INFECTIOUS DISEASES.

CANALIS and MORPURGO (*Fortschr. d. Med.*, 1890, Nos. 18 and 19) refer to the commonly-accepted idea that hunger and other weakening conditions predispose to the development of infectious diseases, but say that this has never yet been proved by detailed experiments, at any rate as regards insufficient nourishment. They give abstracts of the brief notices which have appeared in medical literature bearing upon this subject, and then proceed to detail their own experiments.

The bacilli of anthrax were chosen as those with which to experiment, and pigeons, chickens, and white rats as the animals to be experimented on, since these animals are possessed of comparatively greater resistance to the bacilli, and therefore permitted of observations on differences in the degree of susceptibility.

Series of experiments were performed on pigeons by inoculating them after starving them for several days, or by beginning the starving process immediately after the inoculation was performed, or by starving them first and then beginning to feed them at the time of inoculating them, or, finally, by inoculating at the time the starving was commenced, and later feeding them again. In other cases the whole or the greater part of the pancreas was removed before inoculation, since this gland is especially important to animals which consume cereals.

Observations were also made upon the vitality of the anthrax bacilli after being introduced into the bodies of pigeons.

Experiments of a similar nature were performed on chickens and on white rats, both of which animals are even more resistant to infection by anthrax bacilli.

The effort was also made to determine whether the depression of temperature which accompanies a starving condition was itself the actual cause of loss of immunity against the disease.

The authors deem the following conclusions justifiable:

1. Animals naturally immune from infectious disease can be made susceptible through hunger.

2. Pigeons, usually immune, always die of anthrax when starving is commenced at the time of inoculation.

3. Pigeons which have been starved during six days before inoculation do not take anthrax if feeding is at once commenced immediately after inoculation. If the starvation lasted more than six days they, as a rule, take the disease.

4. The readministration of food will retard the course of, but will not prevent the development of anthrax if the pigeons are allowed to fast during two days after inoculation.

5. Total or partial extirpation of the pancreas usually renders pigeons susceptible to anthrax during a limited time.

6. Anthrax will finally develop in inoculated pigeons, even if starving is not commenced until eight days afterward. Hence:

7. The bacilli of anthrax, introduced under the skin of immune pigeons, remain alive and virulent for several days.

8. The loss of immunity in pigeons cannot depend on the depression of temperature accompanying starvation, since the disease is not taken if a similar depression be produced in other ways, and the animals be meantime abundantly fed.

9. Chickens also may be made susceptible to anthrax through hunger.

10. The majority of the animals of this species died of anthrax if they were made to starve for three to seven days before inoculation, and after it

also until dead. They do not, however, take the disease if starvation is commenced only at the time of inoculation.

11. Adult white rats experimented on remained entirely immune from anthrax, even when allowed to starve a comparatively long time before inoculation.

The Nature and Treatment of Tabes.

Strümpell (*Münch. med. Wochenschr.*, 1890, 39, 667), in an interesting article upon this subject, says that, though there are so many and so varied symptoms of tabes, there are certain of them which seem to be almost invariably present. Such are the three initial symptoms—the evidence of sensory irritation in the skin, legs, arms, trunk, or head, the abolition of the patellar reflex, and the characteristic alteration of the pupil. In a later stage are almost constantly seen the development of certain disturbances of sensation, of bladder symptoms, and of ataxia of voluntary motion. To explain these facts, we should have to assume, even if we knew nothing of its pathological anatomy, that the disease was one in which certain tracts of fibres in the brain and cord were affected according to some law. The determination of just which fibres is, however, a matter of exceeding difficulty. That the degeneration is nevertheless systemic seems now proven beyond a doubt.

We may define tabes as an exceedingly complicated disorder of the nervous system, in which there are in the peripheral nerves, spinal cord, and brain numerous tracts of fibres diseased with at least partial involvement as well of the ganglion cells from which the fibres arise. The disease always begins as a degenerative atrophy of the nerve-fibres. Its distribution always stands in the closest relations to the physiological property of the fibres. Certain systems always become easily and completely diseased, while others are more rarely or only slightly affected. The order in which the fibres are attacked is by no means always the same, though certain rules seem to obtain. The rapidity, too, with which the disease extends from one system to another is subject to great variations. Its point of starting, too, may be most variable.

As regards the cause of tabes the author denies the active influence of exposure to cold, excesses, traumatism, and heredity. He agrees entirely with Fournier, the first to claim that tabes occurred almost or quite exclusively in those who had at some earlier period in their lives suffered from syphilis. He has yet to see a case in which the possibility of a preceding syphilitic infection could be positively excluded. It is a mistake, however, to consider tabes as at all a form of tertiary syphilis, due to a syphilitic affection of the vessels; for the anatomical changes are totally different from syphilitic new-formations, and antisyphilitic treatment is usually entirely unavailing. The degenerative changes of tabes are to be considered as the result of a post-syphilitic intoxication of the body. Thus it is exactly analogous to the paralyses seen after diphtheria; which are the result of a widespread degeneration of the nerves, which has nothing anatomically in common with the primary diphtheritic changes. The nerve-lesions in diphtheria are simple degenerative conditions due to the action of a chemical poison arising within the body. The origin of tabes the author believes to be similar to this. As in the case of all other toxic degenerations of like nature, there exists an intimate connection between the nature of the poison and the nerve-fibres acted upon; each poison being a poison for only certain regions of nerve-tissue, and harmless to others. In this way it can be understood why tabes must be a systemic affection. It is also clear that though mercury and iodine may destroy syphilitic new-formations, they need not be at all active against a chemical toxine.

The author believes that the various crises are best accounted for on the ground that they are of toxic origin. In fact, he knows of no other way to explain them with any satisfaction.

In opening his remarks on the therapeutics of tabes the author refers to several points which he thinks deserve more attention than is usually accorded to them. First, that slight or rudimentary cases of tabes are not of rare occurrence. It is possible that such cases, suffering only from the earliest symptoms, may have all the indications of nerve-irritation disappear, and no further advance be made in the disease.

A second important point is, that there is seen in tabes the sudden failure of certain nerve-functions, which may then gradually recover their previous condition—it may erroneously be supposed, under the influence of therapeutic measures. He believes that these conditions are the result of the sudden inhibitory action of the poison on certain nerve-areas, without there being any actual destruction of them. Recovery takes places just as in cases of severe morphine-narcosis, curare-paralysis, and the like, after the action of the toxic agent has ceased.

The third point of prognostic-therapeutic importance is that all circumstances producing over-strain or weakening of the body in general, or particularly of the nervous system, diminish the resisting power of the nerves to the morbific agent; while the reverse is likewise true, that proper hygienic and dietetic measures exert an inhibitory influence upon this agent. The author particularly emphasizes the importance of avoiding all over-exertion in cases which have as yet shown no traces of affection of the gait.

As to the treatment of tabes, it is evident that no great influence can be exerted in any way upon nerve-fibres already atrophied. The treatment by suspension may, in many cases, be followed by temporary symptomatic benefit, but certainly, he believes, never by any permanent good.

The antisyphilitic treatment can be of no avail against the disease as already developed. It may, however, be tried for two reasons. First, it is conceivable that syphilis still exists in the body, and that by the employment of inunctions in early cases of tabes, the development of further changes may be prevented or at least retarded. He confesses that he has not much hope of any such action. A second reason is that a true specific syphilitic affection of the nervous system—as a gumma—may develop, giving rise to symptoms like those of tabes, or that such a growth may be present in addition to the true tabetic changes. Since it is by no means easy to determine this matter positively during life, the energetic and prompt employment of treatment by inunction is highly to be recommended. We have not yet learned the true method of treatment, which is the employment of such methods as will modify or render powerless the chemical processes going on in the diseased body.

A PARASITIC PROTOZOA IN CARCINOMATA.

SJOEBRING (*Fortschr. d. Med.*, 1890, No. 14, 529), in studying the process of nuclear division in the cells of a carcinoma of the breast, noticed peculiar bodies which he subjected to a careful investigation and discovered them to be microörganisms. He describes these and illustrates their life-history in a lithographic plate.

This microörganism first appears in the form of an exceedingly small, round, protoplasmatic body; seeks a cell-nucleus; penetrates it, and remains there during the first stage of its existence. It then passes out into the body of the cell, or even entirely outside of this. In this period of its existence it grows at the expense of the cells of the tumor, and particularly of their nuclei, its destroying influence being exerted not only on the single cells but upon the entire surrounding tissue. When the microörganism has reached full maturity it nearly fills the cell containing it. At this period it surrounds the cell-nucleus, softening its lining membrane, and absorbing its contents into itself; the achromatin of the nuclear protoplasm appearing in the form of hyaline drops, filling the greater part of the plasmodium, and the chromatin forming a little mass among these.

A membrane now develops around the plasmodium, the hyaline drops become changed into a more homogeneous mass; very minute, curved, rod-like bodies develop in this, and are each surrounded by a small, hyaline, highly-refractive mass, which finally becomes distinctly encapsulated. These fully-developed spores, to the number of twenty or thirty, are contained within and fill the plasmodium as in a spore-cyst; through which they probably finally burst. The rod-like bodies probably last of all burst through the capsule of the spore and develop into the young sarcodes at first decribed.

The author was never able to discover a nucleus colorable with hæmatoxylin at any period of the development of the microörganism. On this account he classifies this body as a sporozoa, probably belonging to the group of the microsporidia.

The size of these microörganisms varies greatly, from one or two up to fifteen micro-millimetres in diameter. As regards the frequency of their occurrence the sarcode forms are very numerous, several being found in each cell, apart from those occurring in the nuclei. The larger forms, connected with the spore-formation, are seen much more rarely.

The author has found this parasitic body in six out of seven cases of cancer of the breast in which he has sought for it. In the seventh case it was not to be discovered with certainty.

In two other cases of cancer of other parts of the body, he has sought for and found them.

URIC-ACIDÆMIA.

V. JAKSCH (*Deutsche med. Wochenschr.*, 1890, 33, 741) has examined the blood of patients in the effort to determine:

1. Whether uric acid took part in the acid intoxication occurring in febrile conditions.

2. Whether it took part in the production of gout or attacks of gout.

He refers to the statements which have already been made in support of this view, but says that investigations in the matter have never been carried out on a large number of patients.

In all he examined the blood of 105 cases in a manner described by him. In 9 instances of healthy individuals no uric acid was found. In nervous diseases it was also absent, and the same was true of 9 cases of typhoid fever. In another case of this disease and in one of intermittent fever there was no uric acid present during the elevation of temperature, though it was detected after fever had disappeared.

In the instances of diseases of the liver, stomach, and intestine examined, uric-acidæmia was only observed when anæmia was also present.

The acid was found in diseases of the heart which produced cyanosis, as also in emphysema and pleural exudates. It was constantly present in considerable quantity in the febrile stage of five cases of pneumonia. In six cases of acute articular rheumatism there was no uric-acidæmia observed.

Very considerable quantities of uric acid were found in all the cases of diseases of the kidneys, and in those of primary and secondary anæmias.

These observations seem undoubtedly to prove that uric-acidæmia is not a pathognomonic symptom of gout, and that it is not a factor in the production of the acid intoxication seen in fever. Fever, indeed, appears to influence unfavorably the production of uric-acidæmia.

It is a noticeable fact that it occurs in renal diseases, anæmias, and in all processes in which the blood is overloaded with carbonic acid. Even in pneumonia the fever is not sufficient to neutralize the action of the carbonic acid in producing this condition.

He does not hesitate to state that uric-acidæmia is due to disease of the red blood-cells, the oxygen-carriers of the blood. Thus, in cyanosed conditions the carbonic acid diminishes the vital energy of the blood-cells; in nephritis, they are not capable of neutralizing the large amount of retained uric acid, and in anæmia the cells are not sufficient in number, and uric-acidæmia therefore appears.

THE PATHOLOGY OF PAROXYSMAL HÆMOGLOBINURIA.

COPEMAN (*Practitioner*, 1890, xlv., 3, 161) records a series of careful observations made upon seven cases of paroxysmal hæmoglobinuria. He details the clinical histories of these cases, the important features being that exposure to cold for a short time would be immediately followed by shivering and blueness, with depression of the bodily temperature. An elevation of temperature next took place, accompanied by hæmogobinuria. Various experiments were performed by varying the duration and method of exposure to cold. The influence of local cold was determined by dipping the hands in cold water, etc. The blood was also drawn from the finger and examined during the period of hæmoglobinuria, and the evidences of the destruction of the red blood-corpuscles noticed.

The results of these observations and experiments showed that one of the first and most obvious phenomena of the disease consists in an enormous and rapid destruction of the red blood-cells, depending on the direct influence of cold. The remaining red blood-cells lost consistence and exhibited great irregularity in shape; while the plasma was tinted by the escaped hæmoglobin and contained masses of hæmatin. That these changes were in reality dependent on cold was further shown by the experiment of placing a ligature around a finger and then immersing the finger in cold water. The blood in this finger alone underwent alteration. Accompanying the pigment in the urine was a proteid consisting mainly of globulin. The pigment from the broken-down corpuscles is originally excreted as oxyhæmoglobin, then passes through a preliminary stage of methæmoglobin before becoming converted into acid hæmatin while in contact with the acid urine in the bladder.

The author discusses the nature of the varieties of hæmoglobin, classifying them as—1, acid hæmoglobin (methæmoglobin); 2 and 3, alkaline hæmoglobin (oxy- and reduced); 4, acid hæmatin; 5 and 6, alkaline hæmatin (oxy- and reduced).

Just as acid hæmatin can be changed by the action of reagents into either form of alkaline hæmatin, so methæmoglobin can be converted into either variety of alkaline hæmoglobin, and the process may be repeated backward and forward any number of times.

It appears probable that paroxysmal hæmoglobinuria is only an exaggeration of a physiological phenomenon. The red blood-corpuscles are constantly undergoing destruction in the circulation during health, but the products of this destruction are used up in the system. If the destruction be only, though during some time, just beyond the normal limit, the system is unable to make away with the products, and albumin appears in the urine. If the destruction be great, though only for a short time, hæmoglobin will appear as well; or methæmoglobin if the pigment be retained in the tubules of the kidney or in the bladder for any length of time.

It has been shown by several writers that temporary albuminuria may follow cold bathing or other exposure to cold in persons otherwise apparently healthy. It has also been found that this occurs at time in persons subject to paroxysmal hæmoglobinuria. In the light of what has been stated, the author deems it impossible that either of these affections can be due to disease of the kidneys.

It cannot, however, be denied that there must be some peculiarity of the red blood-cells in paroxysmal hæmoglobinuria which renders them unduly sensitive to the influence of cold. This is probably to be sought in some disorder of the blood-making apparatus which renders the corpuscles less resistant. This is borne out by the fact that the corpuscles in these cases tend to assume fantastic shapes on the slightest pressure, and do not run into rouleaux, even when there has been no paroxysm for a length of time. Syphilis is a probable cause of this diseased condition. It was present in all of the eight cases reported. Malaria and gout may possibly also exert some influence.

THE DIAGNOSTIC VALUE OF TUBERCLE BACILLI IN THE SPUTUM.

Fussell, in 1887, published the results of his examination of the sputum for tubercle bacilli in 100 cases of pulmonary disease, and concluded that the presence of the bacilli was proof positive of the existence of tuberculous phthisis, while their continued absence was good, though not positive, proof of the absence of phthisis.

FUSSELL and KEILY (*Univ. Med. Mag.*, 1890, iii. 85) now publish a further series of 65 cases, in which the examination of the sputum confirms these conclusions. Of the 65 cases, 44 had undoubted physical signs of phthisis; 4 had doubtful physical signs, yet tubercle bacilli were found in all. The authors give the further clinical history of these 4 cases, which later progressed as ordinary cases of phthisis.

8 cases had no physical signs of phthisis, and bacilli were absent from the sputum of all of them. 9 cases had doubtful physical signs, and bacilli were absent in all. These 9 cases were of especial interest, since in some of them it seemed exceedingly probable that phthisis was present. All of them, however, recovered.

CONTRIBUTION TO THE STUDY OF THE MOVEMENTS OF THE STOMACH, PYLORUS, AND DUODENUM.

A valuable paper appears from the pen of ROSSBACH (*Deutsch. Arch. f. klin. Med.*, 1890, B. xlvi. 276) on the movements of the stomach, pylorus, and duodenum. He reviews what has been done by investigators in the study of the subject, and then details his own observations and experiments. The experiments were performed entirely upon dogs, and consisted in first rendering the animal as quiet or as insensible to pain as possible by the use of curare or morphine, then exposing the stomach and preserving it in as normal a condition as possible by the application of warm, wet cloths, or by filling the abdomen with warm physiological salt solution and then covering it with a warm glass-plate. After this preparation, observations were made upon the movements of the stomach and duodenum, and on the state of the pylorus under different conditions of fulness and emptiness of the stomach and under such influences as irritation of the vagus or the ingestion of cold or hot water.

The results of these observations were as follows:

1. *Stomach.* In the case of the stomach when full of food the peristaltic movements were at first weak, and then, becoming stronger, lasted 4–8 hours. They occurred only in the half of the stomach nearest to the pylorus, the other half was entirely free from movements during the whole period of digestion, and compressed only moderately the gastric contents. The movements always began about the middle of the stomach—the first appearance being as though a cord were deeply constricting the organ—and then passed in waves toward the pylorus, each wave consuming about twenty seconds in its passage. The wave-like motion was so deep at the acme of the digestive period that it temporarily obliterated the lumen of the stomach. Especially was this the case as the wave approached the pylorus. The presence of not too large a quantity of cold or warm beverages increased the force of the peristaltic movements. Large amounts of cold water, however, stopped them entirely for a long time, and made the organ icy cold. Deep morphine- or chloroform-narcosis weakened and retarded them greatly, without, however, causing them to cease during digestion. Section of the spinal cord at the region of the second cervical vertebra, or of the œsoph-

ageal vagus, had a similar effect. After section of the cord the general tension of the stomach upon its contents was lost, and as a result the organ became decidedly larger than in the case of animals whose nervous system had remained intact. If after section of the vagus the serous layer of the stomach was irritated by the faradic current, a powerful contraction was produced at the seat of irritation, but did not advance beyond this point. Faradic stimulation of the cut œsophageal vagus, however, even shortly after death, produced powerful, wave-like contractions in the pyloric half of the stomach, similar to those described.

The empty stomachs of dogs which had fasted from twenty-four to seventy-five hours were small, flaccid, and either entirely without movements, or exhibiting only rarely a weak contraction.

2. *Pylorus.* Observations on the pylorus showed that when the stomach was full it was closed during the whole period of digestion, and for the first four to eight hours did not allow a single drop of nourishment to pass it. Toward the end of digestion the finger could with difficulty be pushed through it from the duodenum, but not before this time. The emptying of the stomach took place suddenly in four or five squirts, the result of a single peristaltic contraction no stronger than those which had preceded it. After more inefficient contractions one again succeeded in expelling some of the food, and then again each contraction for a time drove food into the duodenum. These observations prove that the emptying of the stomach is accomplished not only by the gastric contraction, but that the pylorus has the independent power of opening and closing.

As for the condition of the pylorus when the stomach is empty, our knowledge is not so definite. In all the author's experiments on dogs which had had no food for from twenty-four to seventy hours the pylorus was found closed, and resisted the pressure of the finger from the intestine, though not so powerfully as during digestion.

Section of the vagus or decided curarizing of the animal caused the pylorus to open even when the stomach was full; but section of the cervical cord at the second vertebra was without effect. Irritation of the gastric mucous membrane of the stomach increased the contraction of the pylorus; while irritation of the mucous membrane of the pylorus appeared to diminish the gastric peristalsis. This relation probably prevents the stomach from sending too much of its contents into the duodenum at one time.

The ingestion of much cold water intensified the contraction of the stomach for a time, but relaxed the pylorus completely, so that the large amounts of fluid rapidly passed into the intestine, thus preventing too great a dilution of the food. This opening of the pylorus occurred whether the stomach was full or empty.

3. *Duodenum.* During the whole of the process of digestion the duodenum was entirely without movements of its own. Even when mutilated or irritated in most various ways no movement could be produced. The secretion of the intestinal juices, bile, and probably of the pancreatic juice went on, however, continuously during the digestive period. About the time when the pylorus opens, just before the gastric contents pass through it, peristaltic movements began in the duodenum and continued and increased in strength until the stomach had entirely emptied itself.

It is evident that there must be a nervous connection between the innervation of the stomach, of the pylorus, and of the duodenum. The physiological law might be formulated that irritation of the gastric mucous membrane acts reflexly, producing a stronger innervation of the pyloric muscle, and an inhibition of the movements of the duodenum, but finally a relaxation of the pyloric muscle and an irritation of the motor nerves of the muscle of the duodenum. The result of the resting of the duodenum during gastric digestion is clearly to prevent the removal of the intestinal secretions poured out in the bowel, in order that they may remain in the immediate vicinity of the stomach ready to neutralize and act upon the acid gastric contents when these are finally passed out.

SURGERY.

UNDER THE CHARGE OF

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A REMARKABLE CASE OF INTESTINAL OBSTRUCTION.

DR. WALLACE BEATTY (*Dublin Journal of Med. Science*, third series, No. 126) reports in detail a case which he saw with Sir William Stokes and with Dr. Head, and the course of which he summarizes as follows, the patient being a boy ten years of age: A sudden commencement—the first symptom being abdominal pain followed by diarrhœa, and in about twelve hours by vomiting. The symptoms during the first four days not very urgent; his condition then was abdominal pain of moderate severity, tenderness on pressure in the right iliac fossa, some tension of the abdominal walls, a temperature of 99°, a rather weak pulse, and a thinly-furred tongue.

From the fourth day until the nineteenth—*i. e.*, until the termination of the first stage—his condition was: 1. Some diarrhœa; the motions were sometimes liquid, sometimes formed, never scybalous. 2. Some fulness and tension of the abdominal walls; this was not at all great, and seemed to lessen each day. 3. Slight tenderness in the right iliac fossa. 4. Moderate fever, the highest temperature reached being 101°. 5. A small, indistinctly-felt tumor in the right iliac fossa, present at the end of this stage; and 6. No vomiting. Most of this time the boy felt very well and hungry, and was disappointed at being kept on low diet.

The treatment during this stage was a restricted liquid diet, a few drops of Battey's solution every three or four hours, leeches and wet compresses to the right iliac fossa.

The symptoms during the second stage were—a sudden change in the boy's condition, this change consisting in paroxysms of severe abdominal pain, vomiting, distention of the abdomen, and obstinate constipation. From the commencement of this stage until it terminated the symptoms were briefly as follows:

1. Rapidly-increasing distention of the abdomen, commencing in the umbilical region, and subsequently involving the whole abdomen. 2. Paroxysms of abdominal pain, becoming each day more and more agonizing and subdued only by repeated hypodermic injections of morphine. 3. Vomiting frequent, but fluctuating, not constant, bilious, once or twice fæculent. 4. Obstruction of the bowels almost complete. On only a few occasions some wind and a scanty amount of fæces came away, without giving any relief. 5. Rapidly-increasing emaciation, which became finally extreme. 6. A normal or subnormal temperature. 7. A pulse of fair volume during the greater part of the time, and of moderate frequency—*i. e.*, under 100. Until toward the termination of this stage it was never extremely rapid. 8. At times difficulty in micturition and more or less tenesmus. 9. A sudden relief to the obstruction, occurring when the boy was almost dead.

With regard to the third period—*i. e.*, from the termination of the illness until the present, there are two events to record—the attack of paroxysmal abdominal pain which occurred during convalescence from his illness, and the attack of diarrhœa and vomiting which occurred some months after, and lasted about two days.

On reviewing the case, the diagnosis seems to rest between—(*a*) An intussusception. (*b*) Typhlitis leading to obstruction by producing local paralysis.

The question of intussusception is one deserving of some consideration. There are, undoubtedly, some points in the case which favor this diagnosis: 1. The suddenness of the onset. 2. The first symptom being sudden pain. 3. The presence of diarrhœa during the first part of the illness, which in intestinal obstruction is suggestive of intussusception. 4. The moderate distention of the abdomen for several days. 5. The fact that an indistinct tumor was felt in the right iliac fossa for a couple of days. 6. The change in the symptoms on the nineteenth day may have been due to an increase in the invagination leading to obstruction. 7. The sudden relief may have been due to spontaneous reduction of the invaginated bowel, the other method of spontaneous cure being excluded by the fact that no portion of gangrenous intestine was subsequently discharged.

The chief difficulties which lie in the way of acceptance of this diagnosis are:

1. The early fever. Still, in some cases of intussusception fever has been noted. Treves, in his excellent manual on *Intestinal Obstruction*, when speaking of the temperature in intussusception, says: "It will be below normal in cases associated with shock. In the majority of the cases, and especially in such as are subacute, it is normal, or a little above normal. It is important," he continues, "to recognize the fact that there may be a rise of temperature in intussusception apart from any evidence of local peritonitis. 2. The early local tenderness in the right iliac fossa. 3. The absence of bloody stools. 4. The long duration of the illness, which would be greatly against the possibility of spontaneous reduction, as it would be very unlikely

that adhesions would have formed precluding the possibility of such reduction.

How is the attack of pain with visible peristalsis, which occurred during convalescence, to be explained if we assume that the illness was due to intussusception? Perhaps it was due to a fresh invagination which reduced itself, or, perhaps, to a temporary obstruction due to a weakened condition of that part of the bowel which had been invaginated.

The question of typhlitis remains to be considered. During the first stage of the illness Dr. Beatty believed that the case was one of typhlitis, on account of the early tenderness on pressure in the right iliac fossa, the abdominal tension, the fever, and the presence, after some days, of a small tumor in the situation of the cæcum. The sudden onset is quite compatible with typhlitis, as it usually begins suddenly.

The sudden intestinal obstruction which occurred on the nineteenth day would be accounted for by paralysis of the cæcum, due to inflammation. This was Sir William Stokes's view; and, taking all the symptoms into consideration, it seems to be the true explanation of the case. But there are, no doubt, some difficulties in the way of accepting this view.

1. Why was diarrhœa present during the early part of the illness? Constipation is the rule in typhlitis.

2. How did the obstruction give way? Perhaps it was that on the approach of death a general relaxation of the intestines took place, and as the accumulated contents of the cæcum made their way out.

3. If the typhlitis was severe enough to produce paralysis of the cæcum, is it not strange that the inflammation did not spread to the cellular tissue behind the cæcum and lead to perityphlitis and abscess? There was no evidence of suppuration either during or after the illness.

The Treatment of Subcutaneous Rupture of the Ligamentum Patellæ.

A case of this rare injury, together with a non-operative method of treatment entirely satisfactory in its result, is detailed by Brunner (*Correspondenzbl. für Schweiz. Aerzte,* No. 19, xx. Jahrg). According to Maydl, of forty-six cases suffering from an injury of this nature and treated by means other than incision and suture, twenty-seven were entirely cured, while the remainder suffered from a greater or less disturbance of function. It is certain, however, that many of the imperfect cures were due to intercurrent traumatism or to an imperfect or not sufficiently long-continued treatment, and, moreover, that the majority were reported before sufficient time had elapsed to allow of complete restoration of function. Hence the statistical study does not offer a fair basis for a calculation of the chances of success attendant upon treating subcutaneous rupture of the patellar ligament by splints and compresses.

In the case reported, the patient, a heavy man, aged forty-four years, exhibited for many years the characteristic symptoms of the rheumatic diathesis. From comparatively slight violence he sustained a fracture of the tibia just below the knee-joint. For this he was required to wear a splint for a long time. Some months later, while in the act of sitting down, he heard a crack in the knee-joint. He did not suffer much pain, but found that he was absolutely unable to extend the leg. On examination, the knee-joint was found to be slightly swollen, and the patella was drawn two inches upward from its normal position and was freely movable from side to side. For twenty-four hours the treatment consisted in flexing the thigh upon the body and dressing the limb upon a Volkmann splint; then the leg was brought into a position of maximum extension and a plaster bandage was applied. In eight days this fixed dressing was removed, and the injury was dressed precisely in the manner advised by Trélat in the treatment of patellar fractures. Immediately above the superior border of the displaced patella was fitted a gutta-percha plate; this was secured in position by strips of adhesive plaster carried circularly around the thigh. Over this was applied a plaster bandage extending from the toes to the groin; this was allowed to harden while the leg was held in a position of extreme extension. On the following day an oval trap was cut in the plaster large enough to expose the gutta-percha plate and extending downward to the tuberosity of the tibia. One extremity of the Malgaigne hook was now secured to the gutta-percha plate, the other to the plaster bandage covering the upper extremity of the tibia. On turning the screw the patella was readily drawn to the normal position, except that its lower edge tilted somewhat forward. This was corrected by a compress. After twelve days the patella was found to be secured in its normal position by the healing process. The plaster bandage was allowed to remain for eight days, and was then replaced by an articulated salicylate bandage. Six weeks after the injury the patient was allowed to leave his bed, but no flexion was permitted in the knee-joint for several days. Then the articulated dressing was so arranged that slight flexion was possible; gradually greater freedom of motion was allowed, till in ten weeks flexion to almost a right angle was possible and extension was perfect. Five years later the patient showed absolutely no trace of the injury, the function of the leg being perfect.

The Operative Treatment of Thrombosis of the Sinuses.

Since Dr. Lane reported a case of septic thrombus of the lateral sinus successfully treated by trephining of the skull, followed by incision into the venous channel and evacuation of its purulent contents, the outlook for operation in cases of intra-cranial complications dependent upon otitis media has been decidedly brighter. Two more cases, one resulting fatally, the other recovering, are now reported by Salzer (*Wien. klin. Woch.*, iii. Jahrg., No. 34). The first case gave a history of discharge from the left ear of many years' duration. Shortly following mechanical irritation, occipital headache, fever and vomiting were noted; followed by pain referred to the cervical vertebræ, swelling of the spleen and the physical signs of lobular pneumonia. The pulse was abnormally slow. An examination of the urine showed blood, hæmoglobin, albumin and pus. In a few days the mastoid region was tender, swollen, and œdematous, the patient at the same time becoming somnolent and apathetic. On incision, a pus-discharging opening was found at the posterior border of the temporal bone. The dura was exposed by means of the chisel; a considerable amount of extra-dural pus was evacuated, and the lateral sinus was laid open and cleared of a septic thrombus. The exploring-needle failed to find pus-collection in either the temporal lobe or in the cerebellum. Death followed seven days later from septicæmia and lobular pneumonia. The autopsy showed diffuse suppuration beneath the dura and tentorium, and a thrombus extending from the left into the right lateral sinus.

The second case also suffered from a long-standing middle-ear disease on the left side. The characteristic symptoms of intra-cranial involvement were: apathy, somnolence, with delirium at times, hyperæsthesia, and epileptiform convulsions of the right side of the body, trismus, disturbance in speech, rigors, fever, and, finally, tenderness and swelling over the mastoid process. On opening the skull much pus was evacuated. An area of sphacelated dura was excised, the non-pulsatile sigmoid sinus was incised, and pus and septic thrombi were evacuated, and the wound was packed with iodoform-gauze. Recovery, though slow and complicated by prolapse of the cerebrum, was complete.

The most characteristic symptoms of septic thrombosis of the lateral sinus are, probably: tenderness along the course of the internal jugular vein, evidences of disturbed circulation in the region of the ear, and the symptoms attendant upon emboli being carried to other parts of the body. None, however, are pathognomonic, so that the diagnosis can only be made at the time of operation. Puncture with the needle of a hypodermic syringe will at once determine whether or not the lumen of the venous channel is occluded. If its contents are septic, immediate evacuation is the only rational treatment.

TREATMENT OF CERTAIN FORMS OF INTESTINAL OBSTRUCTION.

JESSETT, after detailing (*Medical Press*, New Series, vol. 1., No. 2684) some original experiments, formulates the following conclusions: 1. Obstruction of the intestines, the result of constricting bands or volvulus, is always met with either in the small intestine or the sigmoid flexure. 2. The most common cause of bands is old peritonitis, local or general; Meckel's or other diverticula may be the cause of constriction of the bowel by snaring or twisting. 3. The predisposing causes of volvulus consist in elongation of certain segments of the intestine, abnormal length of the mesentery, adhesions, or unequal peristaltic action. 4. The higher in the intestine the obstruction the more severe usually are the symptoms. 5. All cases of obstruction should be treated by early abdominal section, and, if possible, reduction of the constricted portion of the intestine by dividing the constricting bands or untwisting a volvulus, that is, if the gentle insufflation of hydrogen gas fails to effect reduction. 6. In all cases where the intestine is very distended, it should be freely incised and its contents evacuated. 7. In all cases in which the constriction is irreducible lateral anastomosis by approximation disks should be practised so as to exclude permanently the seat of obstruction from active fæcal circulation. 8. In cases where gangrene has taken place in the loop of constricted intestine, it should be excised, and the portion of intestine above and below the seat of constriction should be united by lateral anastomosis by approximate plates, the divided ends being invaginated into themselves. 9. All bands and diverticula should be removed when practicable at the time of operation; in the case of volvulus, if the mesentery is abnormally long, it should be shortened. 10.

That enterostomy, or the formation of an artificial anus, should never be performed unless it is found to be absolutely impracticable to reëstablish the continuity of the intestinal canal by dividing the constricting bands by enterorrhaphy or by means of lateral apposition as described.

SUTURE OF THE BLADDER.

In an elaborate article (*Annales des Maladies Org. Genito-urin.*, vol. viii., No. X.) upon the suture of the bladder, DR. DELEFOSSE arrives at the following conclusions :

1. Vesical suture should not be employed in at least two-thirds of the cases of hypogastric section, on account either of the object of the operation itself, or of the condition of the vesical walls, or of the interior of the bladder.
2. It is only absolutely indicated when there is an intra-peritoneal wound of the bladder wall. When a wound of the bladder is extra-peritoneal, vesical suture should be employed when the bladder and kidneys are healthy and the urine is normal.
3. In the great majority of cases of hypogastric section in which the use of the suture has succeeded, a partial suturing or none at all, with the employment of siphon drainage, would give equally good results.

Delefosse concludes his article by quoting, with approval, the opinion of Hache, who says that the dangers associated with complete suture are not compensated for by the advantages which may result from it.

EMPYEMA OF GALL-BLADDER.

DR. WEST HUGHES (*Annals of Surgery*, vol. xii., No. 5) reports a case of suppurating gall-bladder, with cholecystotomy, in two stages, and recovery, giving his reasons for selecting that method: In empyemic distention the walls of the gall-bladder are thickened, non-elastic, and somewhat friable. It would be a difficult proceeding to evacuate the contents through a trocar or by aspiration, enlarge its opening and suture its edges to the wound, without allowing some of the fluid to escape into the peritoneal cavity. In simple distention, the walls being thin and elastic, there would be no necessity for performing the operation in two stages. In such cases the opening in the gall-bladder and the abdominal wound may be sutured separately, the gall-bladder being returned to the abdominal cavity. But a simpler and safer oparation (Tait) is to suture the edges of the bladder-opening to the edges of the wound and insert a drainage-tube into the bladder. At the end of a few days the tube can be removed. Then if the obstruction has been entirely relieved, the fistula will readily heal. If the obstruction still exists (and of this the operator can never be absolutely sure at the time of operation), even if the fistula should close and the distention recur, the wound could be torn open with the finger, or with some blunt instrument, without the administration of an anæsthetic. But if the gall-bladder should have been sutured separately, then in case of a recurrence another operation would be necessary. The indication that there was no longer any obstruction in this case was the escape of bile from the fistula, the contents of the gall-bladder at the time of operation being entirely free from bile. Of course, there never was any obstruction in the common duct, since there was never any jaundice.

EXCISION OF THE CHANCRE TO ABORT SYPHILIS.

H. LELOIR (*Journal de Médecine*, No. 42, vol. ii. p. 618, 1890) reports two interesting cases of excision of chancre. The first was the case of a young man who had had connection with a syphilitic woman. Medical examination made on the day after coitus showed that the woman had chancres and glandular involvement; and some days later the appearance of roseola and mucous patches. The young man was placed under close observation, and directed to examine himself very frequently.

Nineteen days after the coitus a papule appeared on the prepuce. This was excised freely, and the base cauterized upon the morning of its appearance. No glandular involvement could be detected. Six weeks later the symptoms of constitutional syphilis were developed.

In the second case, a man who had never had syphilis, contracted a sore on the prepuce from a woman, who was proved, by medical examination, to be syphilitic. The sore appeared twenty-four days after coitus, and presented every appearance of a chancre. There was slight induration of the inguinal glands, which the patient stated had existed before the appearance of the sore. The chancre was excised five days after it was first observed. The wound healed readily without induration. The man was kept under observation for four months, and examined carefully twice a week, without the appearance of any symptoms of syphilis.

OTOLOGY.

UNDER THE CHARGE OF

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OPERATION FOR EXOSTOSIS OF THE EXTERNAL AUDITORY MEATUS.

DR. HEIMAN, of Warsaw, reports (*Archives of Otology*, vol. xix., July, 1890) a very interesting example of obstructive exostosis in the auditory canal, with an operation for its relief.

A man, twenty-six years old, had suffered long from purulent otorrhœa in the left ear. At last, in August, 1888, he noticed that the discharge was not so great, and at the same time he suffered from violent headache in the corresponding temporal and occipital regions. Examination now revealed a slight paresis of the left side of the face, and slight percussion of the left temporal and mastoid regions was painful. The bony external auditory canal was occluded by a bony tumor, sensitive to the touch, but immovable, its broad base corresponding to the upper and posterior part of the canal. The skin covering it was somewhat reddened. The deeper parts of the ear could not be cleaned. Upon inflation a quantity of offensive pus oozed out through the chink between the growth and the opposite meatus wall, and then the patient felt relief in his head. The hearing in this ear was greatly reduced.

In consequence of the retention of secretion in the ear, "an irritative process had been set up in the dura mater, of either a congestive or a reflex nature, manifesting itself in headache and vertigo." The indication was, of course, to open up the canal in order to allow the pus to drain off, and also, if possible, to cure the disease in the middle ear. Therefore the patient was chloroformed, and the external auditory canal disinfected by a 1 : 1000 solution of corrosive sublimate, when a superficial incision was made with a bistoury through the entire length of the tumor in the direction of the axis of the canal. The tumor was then laid bare and gouged off by two or three strokes of the hammer, beginning in front of its base, so that a thin lamella of the posterior bony wall was removed with it. There was a great deal of hæmorrhage, so that a small ridge of bone at the lower portion of the canal was overlooked. This was thrown off as a sequestrum in two weeks. The tumor was 7.5 mm. long and 6 mm. wide, and 5 mm. high, composed of spongy, bony tissue, excepting the external layer, which was compact. The auditory canal was syringed with a four-per-cent. solution of boric acid and well tamponaded with iodoform-gauze. Forty-eight hours afterward a rubber drainage-tube was substituted for the iodoform tampon. During the first week the slightest touch upon the bony wound caused a marked vertigo and almost unconsciousness. In four weeks all symptoms had gone, and the head felt free; as it had not done for five years. The bony wound healed in four weeks. There was finally seen, when the membrana tympani became visible, a large perforation in its lower half, with the handle of the malleus drawn well inward. The hearing for the watch-tick was now 1 cm., and ordinary conversation at three metres. Four months after the operation there was still no return of the otorrhœa.

A SECOND CASE OF INJURY OF THE BULB OF THE INTERNAL JUGULAR VEIN FROM PARACENTESIS OF THE MEMBRANA TYMPANI.

DR. HILDEBRANDT, the assistant in Professor Trautmann's aural clinic in Berlin, gives an account (*Archiv f. Ohrenheilkunde*, vol. xxx., September, 1890) of the above-named injury, similar to that lately given by Ludewig, as occurring in Schwartze's clinic in Halle. A little girl, four years old, once the subject of otorrhœa, but which had been cured, complained suddenly of earache in the right ear. The membrana tympani had become lustreless, red, and bulging in the lower posterior quadrant. Immediately after an extensive paracentesis, a stream of dark blood gushed from the cut, and flowed from the external meatus in a stream as thick as the little finger. The tampon was applied immediately, the quantity of blood lost being 100 c. c. The hemorrhage stopped at once, and none appeared in the throat through the Eustachian tube. All pain in the ear ceased immediately. In two days the tampon was removed, when the incision was found to be healed. The malleus was sharply retracted. The membrana was pearl color in its anterior portion, but in the posterior quadrant there was still a bluish-red prominence, the size of a pea. It was subsequently observed that this prominence varied in size at times. The reflection of light in the anterior lower quadrant changed its shape when strong pressure was made on the side of the neck over the internal jugular vein, and then returned to its normal form when the pressure was removed from the side of the neck.

It was concluded by Prof. Trautmann that the prominence visible in the lower posterior portion of the membrana was the bulb of the internal jugular vein protruding through a dehiscence in the floor of the drum-cavity. The patient received no injury from the accident. It was observed in this case that the veins of the right side of the face, especially the external jugular, the anterior and posterior facial veins, were fuller than those of the other side. The patient was rhachitic, and bore the marks of this diathesis in the joints and cranium.

AURAL COMPLICATIONS OF GRIPPE.

DR. MÉNIÈRE, of Paris, laid his conclusions (*Annales des Maladies de l'Oreille*, September, 1890) on this subject before the French Otological and Laryngological Society, May 10, 1890. He states that aural complications are the result of retro-nasal affections. Of fifty-seven cases, twenty-three lasted four or five weeks. In eleven cases the lesion was unilateral; in seventeen, bilateral. In another series of sixteen cases, nine were unilateral and seven were bilateral, and the duration of the disease was three months. Eight lasted four months, and five were still under treatment by reason of complications—as periostitis and mastoid inflammation. The treatment consisted in warm-water irrigation in the external canal and in the Eustachian tube, paracentesis of the membrana tympani in some cases, and in four instances thermo-cauterization of the mastoid.

SUPPURATION OF THE TYMPANIC ATTIC AND PERFORATION IN SHRAPNELL'S MEMBRANE.

DR. B. ALEXANDER RANDALL, of Philadelphia, contributed a very interesting paper on this important subject to a recent number of *The Philadelphia Medical News* (September 27, 1890). "The successful treatment of these cases is, of course, the special end of their study, and the questions of the origin, frequency, and seriousness of the lesions are of fundamental importance." If ear disease is not a large element in the practice of the physician, "it makes up for it by its serious importance." "It is not without cause that suppurations of the ear are bars to life insurance; and more often in these than in any others do we have caries just where the meninges are nearest."

In his investigations, Dr. Randall has included cases of perforation in Shrapnell's membrane, with and without concomitant perforations in the membrana tensa—the portion below the line of the folds of the drum-membrane. As a rule, those without any concomitant perforation in the membrana tensa are (in our experience) the most serious, and are those which demand excision of the membrana tympani and the malleus, as they are indications of caries in the head of the malleus, and cannot be cured in any other way.

Dr. Randall, however, prefers to rely on other methods, like injections into the attic, as he has not found excision of much value.

THE FORMS OF NEURITIS OCCURRING IN THE ACOUSTIC NERVE AS THE RESULT OF MENINGITIS.

PROFESSOR GRADENIGO, of Turin, has published (*Annales des Maladies de l'Oreille*, September, 1890) the results of further study of this question, in a paper read at the recent Congress at Berlin. He has demonstrated that grave bilateral purulent infiltrations of the acoustic and facial nerves in the internal auditory canal, sufficient to destroy the nervous fasciculi of the cochlear nerve, where these penetrate the tabula cribrosa, are almost constant symptoms of cerebro-spinal meningitis and also of otitic and tuberculous meningitis. Bacteriological examination of microscopic sections revealed in the pus about the seventh and eighth nerves the existence of the same micro-organisms which had provoked the meningitis, viz., the diplo-streptococcus lanceolatus in cerebro-spinal meningitis, and the bacillus of Koch in tuberculous meningitis. Furthermore, Gradenigo detected in the mucous membrane of the vestibular wall of the tympanum these pathogenic organisms in the region of the canal of Fallopius, so that he inclines to the belief that this canal constitutes in cerebro-spinal meningitis the path of transmission of virus from the internal auditory canal to the middle ear. Thus the pathogenesis of purulent otitis media so often following the otitis interna of cerebro-spinal meningitis, can be explained.

DISEASES OF THE LARYNX AND CONTIGUOUS STRUCTURES.

UNDER THE CHARGE OF

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GUNSHOT-WOUND OF THE PHARYNX AND LODGEMENT OF THE MISSILE WITHOUT ANY SUBJECTIVE SYMPTOMS OF ITS PRESENCE.

DR. EMIL ARONSON, of Libau, has recorded (*St. Petersb. med. Woch.*, No. 36, Sept. 1890) a unique case of the lodgement in the pharynx of a cylindrical iron projectile weighing nineteen grammes, and four and a half centimetres in length, without producing any subjective symptoms whatever of its presence as a foreign body. A man invented a projectile to be held in the mouth and to be discharged at will by blowing a plunger down upon the fulminating compound. He had not taken the recoiling force of the explosion into consideration, and so the first time he tried his projectile it not only went off, but the mobile portion, driven backward, broke through his incisor teeth and became firmly imbedded in his pharynx, whence it had to be pried out.

Laryngitis.

A case of subglottic œdema of the larynx, especially in its posterior portion, after the ingestion of two tablespoonfuls of a 2½-per-cent. solution of potassium iodide, one at noon and the other in the evening, has been reported by Dr. Albert Rosenberg, of Berlin (*Deut. med. Woch.*, Sept. 11, 1890). In most cases of œdema of this character the lesion involves the aryteno-epiglottic folds, or the epiglottis.

Myxoma of the Epiglottis.

In the *N. Y. Med. Journ.*, Sept. 6, 1890, Dr. S. O. Vanderpoel, of New York, reports a hyaline myxoma of the lingual surface of the epiglottis, in association with pernicious anæmia which terminated fatally. The tumor, the bulk of a horse-chestnut, was removed with the electric incandescent snare, and a slight recurrence took place a few weeks later. Dr. Vanderpoel calls attention to the fact that pernicious anæmia and pseudo-leucocythæmia are frequently accompanied by morbid growths in various portions of the body.

Nasal Hydrorrhœa.

In the *N. Y. Med. Journ.*, Sept. 6, 1890, Dr. T. Melville Hardie, of Chicago, reports two instances of long duration in married German women, forty-three and forty-two years of age respectively; a remarkable coincidence in exemplification of the well-known but little comprehended law of similars. The record is enhanced by an illustrated report by Dr. Casey A. Wood on the eye-symptoms.

Look beyond the Nose.

This is the title of a paper (*N. Y. Med. Journ.*, Sept. 27, 1890) by Dr. Solomon Solis-Cohen, of Philadelphia, in which he deprecates the too frequent attribution of neurotic maladies to abnormal conditions of the interior of the nose. In exemplification he details a case of periodical headaches said to have been of twenty years' duration, treated ineffectively for some two years by various rhino-chirurgical procedures, and substantially relieved, if not cured, by constitutional measures, mainly the administration of quinine hydrobromide.

A second case is reported of excruciating headaches and occasional insomnia for years, variously attributed to uterine, ocular, and nasal maladies, and ineffectually treated on these lines, but succumbing in great measure to constitutional treatment directed to gastro-intestinal irritation and consequent lithæmia. A third case is mentioned in which a patient has had no reflex disorders and does not know what a headache is, despite a deviated and thickened septum in contact with both middle turbinates, a posterior enlargement of one lower turbinate, and engorgement of the erectile tissue upon both sides of the septum posteriorly.

DERMATOLOGY.

UNDER THE CHARGE OF

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Immigrant Dermatoses.

In the *Journal of Cutaneous and Genito-urinary Diseases* for October, 1890, WHITE describes the various dermatoses possessing contagious or inoculable properties which are being gradually introduced into this country through immigrants, especially by the less desirable immigrants. Thus, it is known that the relative frequency of scabies is much greater than formerly; the same may be stated, but to a less degree, of favus. The possibility of an increase in the cases of lupus and also of melanosis lenticularis progressiva (xeroderma pigmentosum) is pointed out; and the discovery of imported cases of leprosy is becoming not at all uncommon. It would seem, moreover, that prurigo is no longer such an extreme rarity here as formerly. The author suggests the following measures for Governmental adoption:

1. To cleanse all immigrants of animal parasites, on landing, by treatment of person and clothing.
2. To retain in quarantine all immigrants with other contagious diseases, including venereal affections, a sufficient time for treatment.
3. To return to their homes all persons affected with such contagious diseases as it is impracticable to treat in such way, as leprosy, tuberculosis, and advanced syphilis.
4. To provide for efficient medical inspection at foreign ports of emigration, with the power of arresting importation of dangerous diseases to this country.

Alopecia Areata following Influenza.

In the *London Lancet* of June 7, 1890, WILLIAMSON records a case of alopecia areata following attacks of influenza. The influenza recurred two months after the first attack, at both of which a severe neuralgia of the supra-orbital and occipital nerves was a prominent symptom or complication. The pain was, in a measure, persistent, and later, after several months, was followed by the appearance of bald patches along the course of the affected nerves. The skin of the patches was sensitive and tender to the touch. Recovery gradually took place.

Hereditary Canities.

An interesting example of hereditary canities is reported (*British Medical Journal*, vol. ii. p. 85, 1890) by J. H. MORGAN. From the median line of the scalp toward the forehead a white tuft of hair was present in one or more members of a family for four generations—the maternal grandfather, the mother, the son, and grandchild. In some of the families several exhibited this peculiarity. Another instance, observed by Joynt, is quoted; several brothers, the mother, the maternal uncle and grandfather possessing a somewhat similar white tuft.

THE ABSORPTION OF MEDICAMENTS FROM OINTMENTS.

With this object in view, **LUFF** has made (*Monatshefte für praktische Dermatologie*, Bd. xi., No. 2) the following preliminary experiments, tending to show that the absorption of different drugs may depend, in a measure, upon the ointment-base employed. The experiments consisted in placing a small quantity of 4 per cent. ointments of iodine, carbolic acid, and resorcin, made up with vaseline, fat, and lanolin, in sheep bladder; these were dipped into beaker glasses containing distilled water, which was slightly warmed (to 98° F.) by being kept in a water-bath. The water was tested at intervals to determine the earliest evidence of the presence of the several drugs. The results were as follows:

Ointment of	vaseline	and potassium iodide	evidence in 1	hour.
"	fat	" "	" in 9	hours.
"	lanolin	" "	no evidence in 24	"
"	vaseline	and carbolic acid	evidence in 2¾	"
"	fat	" "	" in 7	"
"	lanolin	" "	no evidence in 24	"
"	vaseline	and resorcin	evidence in 10	"
"	fat	"	" in 15	"
"	lanolin	"	no evidence in 24	"

Luff considers these marked variations due to the physical condition of the ointment-bases employed, and not to any difference in the melting-point, inasmuch as this is about the same—vaseline, 40° C.; fat, 37¾° C., and lanolin, 40° C.

THE INFLUENCE OF MEDICAMENTS UPON THE CULTURE OF THE ACHORION SCHÖNLEINII AND TRICHOPHYTON.

Elaborate and extensive experiments have been made by **SCHWENGERS** (*Monatshefte für praktische Dermatologie*, August 15, 1890) bearing upon the question of the parasiticide properties of the various drugs upon the favus and ringworm fungi. The different medicaments were mixed in several proportions with the culture-medium, and the fungus of favus or ringworm introduced. After several weeks, examinations were made and effects noted.

The results obtained by the writer may be given as follows:

Pyrogallic acid both in alcoholic solution (0.1–1 per cent.), and added as a powder (0.1–10 per cent.) prevented development.

Chrysarobin in alcoholic solution (0.1–1 per cent.) and added as powder had practically no influence.

Ichthyol, in aqueous, alcoholic, and ether solutions had a positive effect when strength was above 1 per cent., and 10 per cent. (aqueous solution) prevented all growth.

Resorcin (0.5–5 per cent.) exerted a restraining influence in weakest proportion and absolute in strongest.

Sulphur (0.2–10 per cent.) had no effect whatever.

Cinnabar (1–10 per cent.) had no effect.

Calomel (0.2–10 per cent.) prevented development.

Corrosive sublimate (0.1–1 per cent.) had an absolute influence in hindering growth.

Iodine (0.1 per cent.), no influence; but in proportion of 5 per cent. prevented development.

Tincture of iodine, about the same relatively as iodine.

Iodoform (1–10 per cent.), no effect upon favus fungus, but in strongest proportion had some influence upon the ringworm fungus.

Aristol (0.2–10 per cent.) upon favus fungus negative, and only a limited influence upon the growth of the trichophyton when in the strongest proportion.

Salicylic acid (1 per cent.) was preventive of development.

Salol, in alcoholic solution (0.8–2 per cent.) no influence; but added as a powder (1–10 per cent.) was preventive.

Oil of cade (1–10 per cent.) stopped growth.

Balsam of Peru (20 per cent.) and styrax liquid (20 per cent.) proved destructive.

Alcohol (2 per cent.), no effect; (10 per cent.) slight influence; (20 per cent.) prevented growth.

Aquæ calcis (1–10 per cent.), no influence.

Sapo viridis (50 per cent.) exerted a preventive action.

The following oils and ointment-bases mixed with the culture-medium in 50 per cent. proportion gave the following results: Olive oil and linseed oil, no effect; simple ointment and benzoated lard, a slight preventive influence; yellow vaseline, a slight effect upon the fungus of favus, and absolute influence upon the ringworm fungus; white vaseline, slight preventive influence; anhydrous lanolin hindered development of ringworm fungus, and apparently, although not conclusively, the same effect upon the achorion Schönleinii. [As regards sulphur the writer's results are in opposition to the effect observed in somewhat similar experiments made by Thin a few years ago.—Eds.]

Note on the Diagnosis, by Means of the Microscope, of Paget's Disease of the Nipple and Breast.

Macallum has (*The Canadian Practitioner*, October 16, 1890) been able, by examination of sections and crusts from Paget's disease, to confirm the importance of the so-called psorospermiæ to which Darier and Wickham have called attention. Until the nature of these bodies is better known, the writer suggests the name "endocyte." The diagnosis may, therefore, be made in this disease in the earliest stages by the help of the microscope. In the examination of the crust the following method, which gives a permanent preparation, was employed: The crust, or a portion scraped from the nipple, was teased out in a drop of tincture of iodine on the slide, the cover-glass put on, and, after a couple of minutes, a drop of 50 per cent. glycerin run in. The alcohol and the iodine fix the endocytes, and the iodine gives them a brown-yellow tint, which fades slowly in glycerin.

OBSTETRICS.

UNDER THE CHARGE OF

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A Clinical Study of the Urine of the Newborn Child.

Hochsinger (*Wiener medicinische Presse*, No. 41, 1890) concludes an extended study of the presence of indican in the urine of the newborn child as follows: Indican is usually not present during the period of lactation, but a trace of this substance is found in children artificially fed. In breast-fed children indican is entirely absent. Simple dyspepsia and diarrhœa and also habitual constipation in nursing children and young children do not produce this body in the urine. Cholera infantum and chronic diarrhœa result in its formation. When primary intestinal lesions and septic infection are excluded a considerable amount of indican points to the presence of tubercular disease. Children older than nurslings show the same reaction to tests for indican which adults show.

A Study of the Configuration of the Fœtal Head.

Runge (*Zeitschrift für Geburtshülfe*, Band xix. Heft 1) summarizes his study of the configuration of the fœtal head as follows: He considers the existence of a pronounced asymmetry in the skull as caused by labor and occurring in a definite way, as extremely doubtful. The act of labor itself has the greatest part in producing asymmetry of the fœtal skull. The great arching of the anterior parietal bone observed in occipito-posterior positions occurs during the act of labor itself, and disappears so rapidly at the completion of labor that a difference of only about a millimetre can be detected. The arching portions of the frontal bone show no especial difference after labor. The sliding of the bones over each other, and also a protrusion or depression of adjacent bony edges is the result of a distinct motion of rotation.

Ten Cases of Tubal Pregnancy and their Pathology.

Orthmann (*Zeitschrift für Geburtshülfe*, Band xx. Heft 1) has made a careful examination of the specimens in ten cases of tubal pregnancy upon whom he performed laparotomy. These patients ranged in age from twenty-six to forty-four years. The greater number were multiparæ, and, as a rule, more than a year had elapsed since the previous pregnancy. The presence or absence of menstruation differed greatly in the different cases. As a rule, it was absent, but hæmorrhage at the time when menstruation should have occurred was not infrequent. In five of the cases the pregnancy was in the right, and in five in the left tube. The duration of the pregnancy did not exceed two months. Two of the patients perished, one from hæmorrhage, one from ileus.

Regarding the pathology of the cases, Orthmann feels justified in concluding that a firm organized blood-clot found within a Fallopian tube renders the diagnosis of tubal pregnancy extremely probable. An intra-peritoneal hæmatocele occurring with a tubal pregnancy results either from rupture of the sac of the ovum, or through an abortion of the ovum which had lodged at the abdominal extremity of the tube. The recognition of decidual cells is not a positive proof of a tubal pregnancy. Villi of the chorion can be distinguished in all cases of tubal pregnancy during the early months.

A Remarkable Continuance of Pregnancy in spite of Intra-uterine Manipulation.

Vickery (*Boston Medical and Surgical Journal*, p. 413, 1890) reports the case of a multipara, nursing a child six or eight weeks old, who observed suppression of menstruation. The patient took tansy tea and turpentine without result. An English catheter was then obtained, and daily efforts made for about three weeks to pass it into the womb to interrupt pregnancy. The patient thought that she had succeeded because a constant uterine hæmorrhage resulted. A physician was called, and pregnancy not being suspected, the patient was given ergotin, in all 72 grains, and the vagina was tamponed. As it was supposed that the placenta had been retained from the previous labor, her physician curetted the uterus, and then applied tincture of iodine to the endometrium. Hæmorrhage continuing, a gallon of hot water was injected three times daily for four days. Dr. Vickery, when called in consultation, found the fundus of the uterus near the umbilicus, and pregnancy undoubtedly existing. Labor was then induced, and a five or six months' fœtus was expelled. The woman escaped septic infection or any permanent injury.

The Treatment of Post-partum Hæmorrhage.

In a discussion before the Obstetrical Society of Moscow, Muratow (*St. Petersburger medicinische Wochenschrift*, No. 8, 1890) reported eight cases of post-partum hæmorrhage in which irrigation with a hot solution of creolin failed to check the hæmorrhage. The uterus and vagina were then tamponed with creolin gauze. Pads and a bandage were placed upon the abdomen, by which external compression was made. The tampons and bandages were allowed to remain two days before removal. Good results followed in all cases.

Rostowzew and Alexandrow reported thirteen cases treated by tamponing the uterus. In a part of the cases the result was satisfactory. In others great pain was produced, and the insertion of the hand within the uterus was considered a safer and more efficient expedient.

The Pathogenesis of Eclampsia.

Blanc (*Lyon Médicale*, No. 38, 1890) has studied the blood of an eclamptic patient by making cultures from this blood in sterilized bouillon. After forty-eight hours numerous fine, short bacilli were observed moving rapidly.

Rabits were inoculated with various cultures from this bouillon, and the first two animals inoculated had albuminuria and were severely affected. Anuria was also present, and both rabbits succumbed after the inoculation. A third rabbit was given an intravenous inoculation of the bouillon, which was not followed by anuria. Two days afterward a second injection of double the quantity of the same material was given. Seven or eight hours afterward the rabbit died in convulsions, having voided a very small quantity of urine which contained much albumin. The kidneys were found intensely congested. The same culture-fluid was then treated with hydrate of chloral, 2 to 1000, and proved harmless when injected. The culture liquids, when set aside and mixed with chloral in various proportions, remained sterile. It was found that 30 to 45 grains of chloral to the quart constituted an excellent antiseptic for the microöganisms inoculated in the blood in eclampsia. The proportion of chloral is 4 to 1000, to destroy effectually these germs.

THE RELATION BETWEEN THE DIAMETERS OF THE CHILD'S HEAD AND THOSE OF THE MOTHER.

SKALKOWSKI (*Archiv für Gynäkologie*, Band xxxviii. Heft 3) finds that the cranium of the child born at term shows a remarkable resemblance to that of the mother, especially as regards the degree of projection of the parietal eminences. The bi-temporal diameter is less proportionately than the corresponding diameter of the mother's head in primiparæ by an inch and three-fourths, the bi-parietal two inches, and the sub-occipito-bregmatic two and a half inches.

OBSTRUCTED LABOR FROM ANTEFLEXION OF THE UTERUS.

MORGAN (*Occidental Medical Times*, p. 571, 1890) reports a case of prolonged labor in which descent of the head failed, apparently by reason of some obstruction. The pelvis was normal. Efforts at delivery by the forceps and by version failed. After labor had persisted until the child was dead, a second attempt at version disclosed excessive anteflexion of the pregnant uterus. The fundus seemed to form a pocket anterior to the patient's abdomen. Descent of the uterus had not taken place, the womb being imbedded or surrounded by fatty tissue and old adhesions. Efforts at delivery increased the flexion, and constricted the fœtus to a greater degree.

A HITHERTO UNRECOGNIZED CAUSE FOR AMNIOTIC BANDS AND ADHESIONS CAUSING AMPUTATION OF THE FŒTAL LIMBS.

KÜSTNER (*Zeitschrift für Geburtshülfe*, Band xx. Heft 2, 1890) reports the interesting case of a multipara who suffered from hæmorrhage continuing for two days, occasioned by lifting a heavy weight at the end of the second month of her pregnancy. She went on to term, however, and was delivered of a living child. On examination, although symptoms of asphyxia were lacking, the child was cyanotic and the eyelids slightly œdematous. This condition disappeared in two days after birth. The hands and feet of the child showed multiple amputations of phalanges. The placenta was of moderate size, and the membranes were extensively torn, but seemed to be complete. The decidual layer on the upper surface of the chorion was very thin, and a dark-colored blood-clot was found near the edge of the placenta. An examination of the fœtal surface of the placenta showed a lack in its usual amniotic covering. When an effort was made to separate the amnion from the chorion it was found that the amnion was absent, the membranes consisting of the chorion and a thin layer of decidual cells. The placental insertion of the cord was peculiar, because of the presence of a sheath of tissue extending three-fourths of an inch upon the cord. A microscopic examination of the membranes showed a layer of large ovoid decidual cells; next to these a layer of small round cells, and next, connective tissue. Küstner's explanation of the case is that the amnion and chorion became separated at the time when the lifting of the heavy weight occurred, followed by the hæmorrhage during pregnancy. Where amniotic bands adhered to the fœtus amputation followed. Compression of the umbilical cord caused the cyanosis observed at birth. Two similar cases have been reported by Gustave Braun, although the pathology of the cases was not recognized.

Amniotic Bands and Congenital Amputations.

An interesting study of a case of this sort is reported by **Therese** and **Broca** (*Bullétins de la Société Anatomique de Paris*, November, 1890, p. 473). Complete amputation at the upper third of the left leg had taken place, the stump not having fully healed. The left hand showed webbed fingers, and to these fingers a long fibrous band was attached. A careful dissection by Broca revealed the skeleton profoundly modified by the amniotic bands which could be in some places detected. The question is raised as to whether these amputations could be instances of ainhum, but there can be no doubt that adherence of the amnion to the fœtus produces these amputations.

Nephritis and Abortion.

A case illustrating the pathology of nephritis during pregnancy is reported by **Gautier** (*Revue Médicale de la Suisse Romande*, No. 11, 1890). The case was a multipara aged twenty-seven years, with previous excellent health. Obstinate vomiting occurred early in pregnancy, followed by prostration and dyspnœa with œdema. Albumin was very abundant in the urine. It became necessary to produce abortion, although the secretion of urine was abundant in amount. Granular casts were also present. The induction of abortion was accomplished by introducing tampons within the cervix. Abortion was followed by the extraction of the placenta and the subsidence of all the symptoms. Upon examination the placenta was found cystic, and with sufficient extent of its surface occluded by white infarcts to account for the death of the fœtus before its expulsion. The early appearance of the albuminuria was also a point of interest.

A Case of Intra-uterine Infection with Typhoid in a Viable Child.

Ernst reports (*Ziegler's Beiträge*, Band viii. Heft 1) the case of a viable child born of a mother ill with typhoid, but never nursed by her. On the fourth day after birth it became suddenly stupid, was marked with jaundice, and showed a fine exanthem upon the legs and lower part of the body. Death ensued. Upon post-mortem examination, icterus, deep injection of the mucous membrane of the stomach, with excessive enlargement of the spleen, were present. Cultures made from the blood of the heart and spleen in the arteries and Malpighian bodies developed typhoid bacilli. It is probable that a large number of bacilli entered the child's circulation suddenly, and increased in number rapidly.

POST-PARTUM ECLAMPSIA AND ECLAMPSIA CAUSED BY FÆCAL INTOXICATION.

FLESCH (*Münchener medicinische Wochenschrift*, No. 42, 1890) reports a case of a patient delivered, after a tedious labor, by forceps, the bladder being apparently empty before delivery. After delivery a tumor was felt in the left lumbar region which disappeared after friction had been made upon the relaxed uterus. The bladder was then discovered to have filled, and a large amount of urine was withdrawn. Flesch diagnosticated hydronephrosis from compression of the ureter. When the uterus contracted and the pressure was removed the urine suddenly entered the bladder. The eclamptic convulsions which occurred after delivery were caused by the absorption of toxic material from the urine retained in the pelvis of the kidney.

A second case of eclampsia was closely related in etiology, albumin increasing as constipation persisted. Flesch remarks that in scarlet fever the albuminuria increases during constipation, and diminishes when this cause is not present. He treats his cases in accordance with this observation.

LACERATION OF THE PERINEUM AND VAGINAL OUTLET; REPAIR OF THE RECENT TEAR.

ROBB (*Johns Hopkins Hospital Bulletin*, December, 1890) states in regard to the repair of such a laceration, that for the immediate operation, the operator must have plenty of hot water at hand, and an ounce of a ten-per-cent. solution of cocaine, if several days have elapsed; in the latter case, while preparing for the operation, the surgeon should place a pledget of cotton, saturated with the solution, within the vagina, and allow ten minutes to elapse to secure its local anæsthetic action.

The only instruments necessary are a needle-holder, a pair of scissors, and a needle threaded with a loop to carry sutures, and perhaps a spoon to hold up the anterior vaginal wall.

The patient should be brought to the edge of the bed in front of a good light, with her buttocks resting on a perineal pad, which will conduct the water used in cleansing and irrigating the parts, by means of the apron, into a bucket beneath. Upon flexing the knees on the abdomen and separating the labia, a deep ragged rent will appear in the posterior vaginal wall, beginning at the fourchette as an apex and extending up to the columna posterior within, and on the perineal surface down toward the sphincter ani. This is the deepest form of superficial tear, involving neither vaginal sulci nor the sphincter ani without.

To proceed with the operation, the labia should be separated by the two fingers introduced within the vagina, and the whole wounded surface thus exposed. The sutures, of silk or silkworm-gut, should be passed a quarter of an inch apart, beginning at the upper angle of the wound and introducing the needle an eighth of an inch from the margin of the tear on the vaginal mucous membrane and bringing it out at the bottom of the rent, at a point much nearer to the operator than the point of entrance, and re-introducing it at the bottom of the tear, and bringing it out on the opposite side at a point corresponding to the original point of entrance. The object of passing the sutures thus is to pull up the floor of the rent as high as possible, for, by the labor, the whole pelvic floor is depressed, and those parts lying in the middle, more so than those at the sides. By means of the sutures thus introduced the tissues at the sides less movable than those in the centre, because of their close attachment to the pubic rami, become the points toward which the depressed centre is raised.

These sutures can be tied at once from above downward, and by this simple arrangement almost the whole wounded area can often be disposed of by as few as three sutures.

Two or three superficial perineal sutures on the outside will finally give a perfect closure, thus restoring the perineum and vaginal outlet to their original integrity.

The after-treatment is of great importance, as there is danger of doing both too little and too much. The general injunction that the patient must lie motionless in the recumbent position, is not necessary. She should be allowed to move very gently from side to side, preventing the knees from separating widely. Another important detail of the after-treatment is the regulation of the bladder. She should be allowed to pass her water if she can, and if this is impossible, a clean glass catheter should be used every six or eight hours. Before catheterization, the parts should be cleansed, particularly around the urethral orifice, with a piece of absorbent cotton. After the urine has been passed, the labia minora should be gently separated, and any fluid around the orifice of the vagina gently taken up on a piece of absorbent cotton, and some antiseptic powder sprinkled within the vulvar orifice by means of a camel's-hair brush or a pledget of cotton held by a pair of dressing-forceps.

GYNECOLOGY.

UNDER THE CHARGE OF

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OF NEW YORK.

The Treatment of Retroflexion by Pelvic Massage.

Döderlein (*Med. Anzeiger*, August, 1890) has simplified Brandt's method of treating posterior displacement. Having restored the tone of the relaxed uterus in a few *séances*, by stroking the organ in a direction from the fundus toward the cervix, he seeks to bring it to its normal position of anteflexion by forcing the cervix forward and upward with the finger within the vagina, while the hand upon the abdomen crowds the body of the uterus downward and backward upon the cervix. This forced compression causes an elongation of the shortened posterior wall of the organ. If there is no peri-uterine inflammation considerable force may be employed without giving pain. This method is particularly applicable to cases of retroflexion occurring during the puerperium. The writer reports six cases, in four of which, by daily *séances* of five minutes' duration, he succeeded in restoring the uterus to a position of permanent anteflexion within from two to four weeks.

Sarcoma of the Uterus.

Kaltenbach (*Ibid.*) reported seven cases of this affection, the disease being confined to the corpus uteri in two, to the cervix in three, and involving both cervix and body in two. Between diffuse round-celled sarcoma of the endometrium and fibro-sarcoma, he stated there were many transitional forms. The uterus was extirpated per vaginam in every instance but one, when the organ was so large that it was necessary to adopt the combined method. All the patients made a good recovery, but two had a recurrence within eight months, and in the case of four others a year had not yet elapsed since the operation; one patient was in robust health at the end of two years and a half. Their ages varied from twenty-five to forty-seven. Recurrence took place in the form of metastatic nodules within the abdomen. In an eighth case (that of a girl, æt. fifteen), in which supra-vaginal amputation was performed there was metastasis in the retro-peritoneal glands. In a ninth inoperable case the patient had formerly had a placental mole removed, which seemed to confirm Leopold's observation that sarcoma of the corpus uteri might originate from adherent portions of myxoma chorii, which latter Virchow regards as a true neoplasm.

Reduction of Chronic Inversion of the Uterus by Hydrostatic Pressure.

Neugebauer, Sen., (*Ibid.*) contends that this is the ideal way of reducing chronic inversion, supporting his opinion by a case of two years' standing, in which reduction was effected in nineteen days by means of a rubber bag which was gradually distended with water. The patient suffered no pain, and learned to fill and empty the bag herself when it was necessary to relieve the pressure upon the urethra. The writer considers this as the safest and least painful, although it may be the slowest, method of reduction.

Pseudomucin in Ovarian Cysts.

In an elaborate paper with this title Pfaunenstiel (*Archiv für Gynäkologie*, Band xxxviii. Heft 3) makes a contribution to the study of the chemistry of cyst-contents. He concludes that there are several varieties of pseudomucin, which resemble mucin in setting free sugar when treated with acids, but differ from it in their behavior with acetic acid. The most common variety is the tenacious pseudomucin found in proliferous adeno-cystomata.

A second variety forms a firm colloid mass closely related to colloid cancer; a third appears as a watery fluid easily soluble, and found in only a few ovarian cysts. The first variety is a true cell-secretion; the origin of the other two is unknown, though the third may be a product of cell-disintegration. It is evident that, practically, the presence of pseudomucin in fluid withdrawn for diagnostic purposes from an abdominal tumor does not prove that it came from an ovarian cyst, as it has been found in cancerous ascitic fluid.

THE TREATMENT OF ABSCESS OF THE TUBE AND OVARY BY VAGINAL INCISION.

In a recent discussion at the Société de Chirurgie, **TERRILLON** stated (*Le Semaine Médicale*, No. 28, 1890) that up to 1888 he had treated this condition by vaginal incision and drainage with indifferent success, since which time he had invariably employed abdominal section and extirpation of the diseased adnexa. **TERRIER** said that he had never been able to see any advantage in vaginal drainage, since, aside from the immediate dangers, a permanent fistula usually resulted, so that the patient was not cured. He recommended laparotomy in every case of peri-uterine suppuration. No matter of whatever origin, elevation of temperature in connection with disease of the adnexa was a sufficient indication for abdominal section. **DEPRÈS** insisted that a distinction should be made between pelvic abscesses proper and those which had their seat in the ovaries or tubes. He had repeatedly cured pyosalpinx by puncture *per vaginam;* vaginal incision and drainage were, of course, to be recommended only when the abscess clearly pointed in the posterior fornix.

THE MORE REMOTE RESULTS OF REMOVING THE OVARIES AND TUBES.

KELLY (*Johns Hopkins Hospital Bulletin*, 1890) summarizes from his experience in ninety-six cases of salpingo-oöphorectomy as follows: A small percentage of the patients were restored to perfect health within a few weeks after operation, a larger number were eventually restored to comparative health, and a few were no better subjectively after the operation. He adds the following suggestions for avoiding some of the ultimate bad results of laparotomy: 1, as the ligature often remains as a septic focus, it should not be passed through the pedicle of a pyosalpinx as long as there is pus in or about the stump; 2, a large-sized drainage-tube should be used, and should be dispensed with as early as possible; 3, the operator should work deliberately and carefully, handling the intestines as little as possible; 4, the specimen should be carefully inspected before the abdomen is closed, with the purpose of determining if any portion of the ovary or tube has been left behind; 5, the patient ought to remain longer in the hospital, and should be kept under observation for months after the operation.

ENDOTHELIOMA OF THE OVARY.

POMORSKI and **VON VELITS** (*Zeitschrift für Geburtshülfe und Gynäkologie*, Bd. xviii. Heft 1) each report a case of this rare affection, which is to be regarded histologically as angeio-sarcoma, developing from the walls of the capillaries. Eight cases in all have been reported by German authors, the first by Leopold.

Case I.—The patient, who was forty-nine years of age and had reached the menopause sixteen months before, applied at Martin's clinic complaining of severe pain in the right iliac region. She was found to have an ovarian tumor which was removed with considerable difficulty, the patient succumbing on the third day. The growth was at first regarded as carcinomatous, but on careful microscopical examination it was pronounced to be an "endothelioma lymphaticum."

Case II.—Professor Tauffer, of Buda-Pesth, operated upon a virgin, æt. twenty-four, who had had a tumor nine years, the size of a man's head. It sprang from the left ovary and was so firmly adherent that the patient did not survive the shock of its removal. Microscopically it proved to be an "endothelioma cysticum myxomatodes."

THE CONDITION OF THE ENDOMETRIUM IN CANCER OF THE CERVIX.

SAURENHAUS (*Zeitschrift für Geburtshülfe und Gynäkologie*, Bd. xviii. Heft 1) has made careful microscopical studies of cancerous uteri with the view of verifying Abel's statement that the corporeal endometrium in cases of cancer of the cervix undergoes sarcomatous degeneration. He examined fifty uteri which had been removed *per vaginam* from the living subject, the disease being confined to the portio-vaginalis in twenty-two, and the cervix being involved in twenty-eight. He was unable to find any evidence of sarcomatous degeneration of the corporeal endometrium, or, in fact, any evidence of malignant changes. The microscopical appearances were those seen in ordinary hyperplastic endometritis. Spindle-cells were uniformly present, but always in the vicinity of the hypertrophied glands. [As the writer aptly concludes, these careful and exhaustive observations destroy an argument in favor of total extirpation of the uterus for cancer of the cervix, as opposed to high amputation, upon which considerable stress has been laid, viz., that even when the disease is limited to the portio-vaginalis, the corporeal endometrium may have already undergone malignant degeneration. We have been able to demonstrate to our own satisfaction, from an examination of twenty cancerous uteri, that there is nearly always present a marked degree of hypertrophy of the corporeal mucosa which might readily be mistaken for a malignant growth. Since the uterus is uniformly enlarged and congested in connection with carcinoma of the cervix, hyperplastic endometritis would naturally be present, as in cases of subinvolution and myofibroma. Pathological observations, in order to be of practical value, must be absolutely unbiassed. It is fatal to the worker in the laboratory to be too strongly tinged with surgical enthusiasm.—ED.]

THE ORIGIN OF EPITHELIAL GROWTHS OF THE OVARY.

STEFFECK (*Zeitschrift für Geburtshülfe und Gynäkologie*, Band xix. Heft 2) concludes an elaborate article on this subject with the following deductions: 1. Ingrowths of the germ-epithelium are observed only in tumors, never in normal ovaries. 2. The germ-epithelium retains its normal appearance longest in cysts that are undergoing cancerous degeneration. 3. Ingrowths of germ-epithelium do not arise by active proliferation of the epithelium. 4. The follicles may form irregular spaces lined with a single layer of cells. 5. The epithelium lining the primary and ripe follicles may form epithelial pouches which subsequently become shut off and form new cysts. 6. During the early stages of degeneration of the follicles the ovum is still visible. In short, epithelial growths of the ovary may originate from follicular epithelium, as well as from ingrowths of germ-epithelium.

THE ANATOMY OF THE NORMAL ENDOMETRIUM.

Boldt read (*Med. Anzeiger zum Centralblatt für die Ges. Med.*, August 30, 1890) a paper on this subject at the recent International Medical Congress in which he sought to prove that the utricular glands, both in the cervix and in the body, are surrounded by interlacing muscle-fibres, which are continuous with both the muscle-bundles of the uterine wall and with those traversing the lymphoid tissue of the mucous membrane. This periglandular muscular layer is developed most richly at the junction of the mucosa and muscularis mucosæ, and extends along the glands up to their mouths. The natural inference is that by their contraction the fibres assist in discharging the natural secretion of the gland.

THE BACTERIOLOGICAL EXAMINATION OF PELVIC, TUBAL, AND OVARIAN ABSCESSES.

Boisleux (*Ibid.*) from a careful study of forty-two cases arrives at the following practical conclusions:

1. The escape into the peritoneal cavity of pus from diseased tubes, or abscesses, should always be carefully guarded against.

2. The amount of such virulent pus which escapes is of no importance, since a small quantity is as dangerous to the patient as a large quantity.

3. If this accident occurs the operator should not be satisfied with irrigating the cavity with sterilized water, but should use some weak antiseptic, such as would cause the least possible irritation of the peritoneum. Cauterization of the pedicle after removal of a pus-tube, and packing pelvic abscesses with iodoform-gauze are efficient means for preventing infection.

INTRA-UTERINE GALVANIZATION A SCIENTIFIC ERROR.

In a paper with this title (*Ibid.*) **Daniou** attacks Apostoli, affirming that the constant current does not have a general caustic action, since the electrode comes in direct contact with only a few points on the mucosa. He cites in support of this a fatal case of Apostoli's in which a current of over 100 milliampères had been used several times, and yet at the autopsy no evidence of any caustic action was found within the uterus, except at the os internum. With regard to galvano-puncture, it was urged that the finer the needle employed the more marked was the result obtained, which in itself appeared to be a contradiction. The writer's own method of applying electricity was by means of a tampon of sponge (*tampon électrique*) which was almost entirely covered by rubber. This he saturated with salt water, applied to the portio vaginalis, and passed through it a current varying from 70 to 150 milliampères for not longer than six minutes, when the current was reversed, and this was repeated two or three times. The advantages claimed for this method of application over the intra-uterine were absence of pain, rapid diminution in the size of the growth, checking of hæmorrhage (without recurrence, as was noted after intra-uterine galvanization), relief of pain, and, above all, absolute safety. He had practised his method 2000 times without a bad result, whereas, in Paris, the average mortality with intra-uterine galvanization was at least 5 or 6 per cent. [This attack upon Apostoli seems to us to be at once unjust and uncalled-for. The writer appears to be influenced by some personal animosity which prevents him from viewing the subject in a broad and scientific spirit. The work of Apostoli is too well established to be shaken by such attacks, and his statistics alone are a sufficient reply to his detractors.—Ed.]

PÆDIATRICS.

UNDER THE CHARGE OF

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Pneumonic Form of Tuberculosis in Children.

According to Hutinel (*Rev. Mens. des Mal. de l'Enf.*, June, 1890), in the acute form of tuberculosis in children the apices of the lungs are frequently uninvolved, tubercles being generally disseminated throughout the remainder of the organs. A very interesting form of tuberculosis is that which presents the appearance of pneumonia. In a case of this character there was malaise for fifteen days with slight elevation of temperature. Eight days later there were loss of appetite, vomiting, and cough. Physical examination showed dulness in the supra-spinous fossa, murmur, and bronchophony—in a word, there were signs of pneumonia in the superior lobe of the lung. Defervescence followed, but the tongue remained dry, the general condition was bad, and the temperature rose. Tuberculous pneumonia was diagnosed, and in a few days the child died with phenomena of meningitis. The autopsy showed extensive caseous pneumonia. In children, a pneumonia which has not resolved by the eighth day is almost always tubercular in character.

In a second child, who had been sick only three days, there were signs of pneumonia at the apex, but there were also cavernous râles at the apex, rough breathing, and fever to an unusual degree. Tuberculous pneumonia was diagnosed, and this diagnosis was subsequently found to be correct.

Such possibilities must be remembered in treating pneumonia, thus allowing a certain reserve as to prognosis. The prognosis of ordinary pneumonia in children is always favorable, while that of tuberculous pneumonia is uniformly bad.

SALOL IN THE GASTRO-INTESTINAL DISEASES OF CHILDREN.

In the treatment of these disorders, DROIXHE found (*Journ. d'Accouchements*, February 28, 1890) that salol administered by the mouth is unchanged until it reaches the intestine and is acted upon by the pancreatic secretion. It is then decomposed into carbolic and salicylic acids. Barr reports thirty-five cases of gastro-intestinal inflammation which were treated with this agent. In cases in which there was acute gastro-enteritis with vomiting and copious offensive stools salol was efficacious. If the stools were lumpy and the vomit mixed with bile calomel gave better results than salol. With the serous stools of dysentery and colic, opium should be combined with salol to allay the tenesmus. Salol was found efficient in the first period of acute gastro-enteritis and the chronic forms of entero-colitis. The dosage was three centigrammes for children under six months of age, three to nine centigrammes for those of sixteen to eighteen months, and twelve centigrammes for those who had passed the second year. The drug is easily given, and is without toxic action. It is an approved intestinal antiseptic, ranking with naphthol, naphthalin, bisulphide of carbon, and Belloc's charcoal. It may be combined with saccharate of cannella in the treatment of cholera infantum. Loewenthal used it to prevent the proliferation of the bacillus of cholera and the formation of toxine, which is produced by contact of the bacillus with the pancreatic secretion, in the presence of peptonized albuminoids. Experiments were made by this author upon mice, infected material being injected into some of them without salol, and into others with salol. The former became very sick or died, while the latter were unaffected.

ICTERUS NEONATORUM.

NEUMANN (*Virchow's Arch.*, cxiv. 3), in earlier publications, has shown that in icterus neonatorum the biliary coloring-matter distributed through the blood, the transudations, and the tissues, has a tendency—post-mortem—to take a granular and crystalline form. For the investigation of this subject, one may take a small piece from the great omentum and spread it out under the microscope. A little dilute acetic acid being added to break up the red corpuscles, one may see the fat cells crammed with bilirubin granules, pigment-needles being absent. In fœtuses which die during or immediately after birth, traces of bilirubin may usually be found. In eight cases the pigment-formation was limited to the fatty tissue, including the greater omentum, the subserous tissue of the parietal peritoneum, the capsule of the kidneys, the pericardium, and the mediastinum. In these cases there was no question about the conversion of the blood coloring-matter into biliary coloring-matter, as is the rule in fœtuses which have died *in utero*. In cases in which biliary coloring-matter is present, and in which the imbibition of bile from the surrounding tissues can be excluded, there is often sufficient biliary coloring-matter in the blood to give the skin an icteric color, though the children might have been normal at birth in other respects. If it were only possible to demonstrate in the blood of the umbilical cord, in children born alive, the presence of biliary coloring-matter, we should have a clue to the proof that icterus neonatorum is a consequence of certain misdirected physiological processes of fœtal life; but as yet no one has been able to do this.

NEPHROTOMY FOR TUMORS IN CHILDREN.

FISCHER performed (*Jahrb. f. K.*, xxxi. 1 and 2), between 1873 and 1883, ten operations upon children for the removal of renal tumors. The operation was fatal in eight of the cases, and the disease recurred in one of the remaining ones in nine months, and the other in a year and a half. Six nephrotomies were performed between 1883 and 1889 upon children, one dying from the operation and five from recurrence of the tumor. From 1873 to 1888 thirty-one nephrotomies were performed on children, four being incomplete on account of serious complications. The tumors in two cases were non-malignant, one patient dying, the other recovering. Of twenty-five operations in which there was malignant disease, death occurred in one case from hæmorrhage, and in nine from shock, vomiting, carbolic-acid poisoning, or intestinal paralysis; in seven others death was occasioned by recurrence of the tumor. There were nineteen cases of sarcoma, one of encephaloid cancer, one of adeno-sarcoma, one of myxo-sarcoma, one of carcinoma, two of spindle-celled sarcoma, one of alveolar sarcoma, one of myo-sarcoma, three of round-celled sarcoma, and two of spindle- and round-celled sarcoma. The right kidney was diseased in eight cases, and the left in five. The ages of the children varied from eleven months to eleven years. All operations upon children under two years of age were fatal. Of the intra-peritoneal operations, 52 per cent. were fatal; of the extra-peritoneal, only 10 per cent. Contra-indications to the operation are great weakness, absence of one kidney, disease of both kidneys, very large tumors, and metastatic deposits. Life may be prolonged by the operation, which will be of value according as it is done early in the history of the disease.

THE FUNCTIONS OF THE NORMAL AND THE DISEASED STOMACH AND THE THERAPEUTIC RESULTS OF IRRIGATION OF THE STOMACH DURING INFANCY.

LEO experimented (*Jahrb. f. K.*, xxxi. 1 and 2) with thirty infants ranging in age from two hours to twelve months. An hour to an hour and a half elapsed before the removal of the contents of the stomach in breast-fed children in the first few months of life; with older children fed with cow's milk the time was two hours. The food contents of the stomach being removed, there still remained a small quantity of yellowish fluid which showed all the characters of the secretion of the stomach. It was regarded as the residuum from the digestive process. Fifteen minutes after milk was taken there was found a weakly acid reaction to the withdrawn fluid. Within an hour free hydrochloric and lactic acids were discovered. The hydrochloric acid is at first taken up by the milk as soon as it is secreted, part of it being neutralized, and part entering into acid combinations. Albumin-digesting ferment and lab-ferment were always demonstrable in the full or the fasting stomach, even in the newly-born. The contents of the stomach being removed at varying periods after eating, it was found that actual peptonization of the albumin took place, though only to a very slight degree. Notwithstanding the want of free acid in the stomach, very many of the germs taken with the food are destroyed in the process of digestion. The pathological questions pertaining to this subject were studied in the examination of one hundred and four infants who suffered from acute dyspspsia, cholera infantum, or chronic gastro-enteric disease. In all cases it was found that the milk remained in the stomach an abnormally long time, owing to deficient motor function in the muscular structure of the organ. Marked acidity was present in many cases, as the result of the formation of abnormal organic acids or the excessive secretion of hydrochloric acid in consequence of the irritated condition of the stomach. Pepsin and lab-ferment were found in all cases. It was considered a fair conclusion that by removing the decomposing matter from the stomach, preferably by irrigation, a cure would result in many cases of acute and chronic disease. Very good results were obtained by the author in cases of acute dyspepsia with constant vomiting, also in simple or severe diarrhœa. In cholera infantum the results were less satisfactory.

Corrigendum.—On page 57 of the January number of the JOURNAL, on 16th line from the bottom, for Dr. Hahn *Dr. Kahn* should be substituted; on third line from bottom, for salt bags, read *ice bags.*

Note to Contributors.—All contributions intended for insertion in the Original Department of this Journal are only received *with the distinct understanding that they are contributed exclusively to this Journal.*

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THE

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OF THE MEDICAL SCIENCES.

MARCH, 1891.

A CASE OF SENSORY APHASIA—WORD-BLINDNESS WITH HEMIANOPSIA.

By William Osler, M.D.,
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This case illustrates the following points: (1) The association of word-blindness with disease in the parieto-temporal region; (2) The paraphasia which so often accompanies this condition; (3) The occurrence of hemianopsia from interruption of the fibres of the optic radiation, without disease of the occipital lobe.

Clinical Summary.—*Inability to read a newspaper the first symptom; typical word-blindness, retention of intelligent hearing; misplacing of words and sentences—paraphasia; right homonymous hemianopsia; no paralysis; persistence of this condition for over two months, with gradual loss of muscular strength and mental power. For thirty-six hours before death, paralysis of right arm and leg.*

Anatomical Summary.—*Necrotic softening in the left hemisphere of the supra-marginal and lower part of angular gyri, of the posterior part of the first and second temporal, and of the two annectant convolutions uniting the first temporal to the parietal lobe. Complete transverse softening of the white matter between these convolutions externally and the lateral ventricle. The gray and white matter of the occipital lobe uninvolved.*

John W., aged seventy-two years, Scotchman, bookkeeper, applied at the Philadelphia Infirmary for Diseases of the Nervous System, November 14, 1888, complaining of uneasy sensations in his head. He was a healthy, vigorous-looking man, perfectly intelligent, and spoke well and clearly. It was not thought at first that there was anything the matter with him, beyond slight headache; but it was noticed that he had occasional difficulty in getting the word he wished, and this circumstance led to a more careful examination. He says he has been a temperate man, and has always enjoyed excellent health. He has not had syphilis. For some time past he has not felt as well as usual. On November 1st, while at his supper, in a restaurant, he found that he could not read the daily paper. He was sure that this came on quickly, and had been his chief annoyance, as he was an ardent politician. He had no definite headache, but complained of a diffuse, uneasy sensation, and sometimes placed his hand upon his head saying, "It is all wrong here."

Present condition: Vigorous-looking man for his age; face intelligent; speaks clearly and rapidly, with occasional interruptions; no paralysis; movements of the arms, legs, and face perfect; no loss of sensation on either side; no incoördination; he stands well with his eyes shut; reflexes normal.

Speech: Though he speaks clearly and intelligently, and utters some sentences without interruption, replying promptly and fluently to questions, and evidently understanding everything, there is very distinct speech-disturbance; thus, for some time he could not give the address of his residence. He says he knows where it is, but could not pronounce it. He told the first name of the man with whom he lived, but could not say the second. He could not name his own occupation, but said, "Keep, keep, keep. Oh, you say it for me." When told—bookkeeper—he repeated it distinctly. He occasionally misplaces words. In referring to a wetting which he had spoken of, he said, "Deliberate attacks of wet dress." When a printed or written page is presented to him he does not appear to comprehend the words. The word Philadelphia at the head of a hospital blank, he read P, r, i, n, g, r, e. k. When told that it was Philadelphia, he replied, "Oh, certainly it is, I've known it for sixty-five years." His age, 72, written on a slip of paper, he read 213. He did not recognize the words "Cleveland and Harrison" at the top of a newspaper column, but when read to him, said, "I know all about them," and began making some very shrewd observations. He can write his name, but says that since his failure to see he does so with difficulty. He writes as well with his eyes shut as when they are open, but does so with hesitation. He wrote the name of the hospital, and the words "Philadelphia Record." He could not read the words of his name after he had written them. He names objects held before him quite readily.

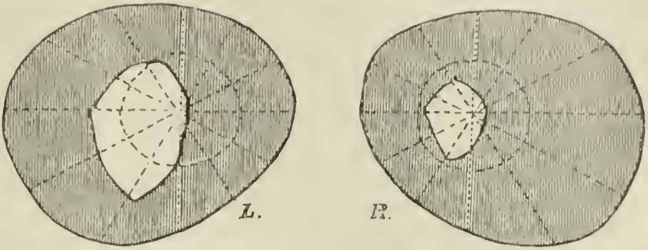
Dr. de Schweinitz examined the eyes, and reported the presence of right lateral homonymous hemianopsia. Dr. de Schweinitz's report is here annexed:

Right eye: An oval optic disk, with the scleral ring plainly followed all round, and both superficial and deep layers very gray; the veins full and dark, the arteries unchanged in size; a fine retinal haze veiled the upper and lower margins of the disk; there were no splotches or hæmorrhages in the general eye-ground, and no changes in the macular region.

Left eye: An oval optic disk, with well-marked scleral ring, more visible than on the opposite side, because the retinal haze seen in the opposite eye was less apparent. A similar appearance of the retinal circulation and an absence of gross changes in the retina and choroid;

the disk was also gray, but not so devoid of color and capillarity as that upon the opposite side.

FIG. 1.



The oval outline of each figure is the average normal field of vision; the shading represents the blind areas. The asterisk is the fixing-point which is not exactly bisected by the line of division, but this passes a little to the right, although touching the fixing-point. There is decided contraction of the left half of each field, most marked upon the right side; that is, upon the side opposite to the lesion. The fields were taken with a one-centimetre square of white, pasted upon a dead black surface.

November 21, 1888. Patient was admitted to hospital with no essential change in his condition, though he did not seem to misplace words so often. He could not say his age, 72, but said "60 and 10 above that and 2 above that—that's 72." He knew the day of the week and of the month, and what year it was. He was asked how many years after Burns's death he was born, and said 5000, but at once corrected himself and said "No, no; I do not mean that—twenty-five." The state of word-blindness persisted. He was given a newspaper, the Philadelphia *Record*, and asked to read its title. He said "Christian Observer." It was difficult to get him to write, and it was impossible for him to do so from dictation for any lengthy sentence. He wrote the word "Record" when told to, but after he had written it he spelled it "Freedom."

For the first two weeks in hospital there was no special change. He seemed to speak with rather fewer errors. He kept very quiet, and did not care to talk with the other patients. When asked how he felt, he generally placed his hand upon his head and repeated several times the phrase "All wrong here."

December 6. For several days he has vomited frequently.

8*th*. The following note was made: "Talks less freely. Speaks intelligently and plainly at first, but after a few minutes it is difficult to understand what he states. No additional ocular changes. The grip in the hands is equal. He walks with a somewhat tottering gait, though there is no actual paralysis."

For the next three weeks the condition remained practically unchanged. Early in January he became distinctly weaker.

On the 4th the following note was made: "Patient has been in bed for several days; no paralysis of motion or of sensation. He seems to understand and usually answers correctly, though, as was frequently noted, he would not give his age correctly, saying any figures. When first spoken to, his speech is clear and distinct, and then in a few minutes becomes very incoherent and mumbling. Lately he has been very noisy and restless at night, getting out of bed and walking about the ward."

On the 12th the note was: "Remains in the same condition; no fever; no paralysis; talks without difficulty; answers some questions correctly, others in a senseless manner. Says continually 'Lord, have mercy.' No disturbance of sensation."

On the 15th the note was: "Has been very wakeful for the past two days. This morning could not be roused. He lies with his head turned to the left, but sometimes moves it to the right. No conjugate deviation of the eyes. Pupils equal and of medium size; react feebly to light. Muscles of the right side of face seem to act as well as those on the left. There is complete paralysis of the right arm, which has come on within the last twenty-four hours. He moves the right leg, but when lifted it falls more rapidly and with more dead weight than the other. He is in a semi-comatose condition. There are loud bronchial râles." He sank and died on the afternoon of the 16th.

Post-mortem, five hours after death: Body moderately well-nourished; no rigor mortis; calvaria thick and symmetrical.

Dura was normal and very closely adherent to the skull; sinuses contained recent blood-clots; a moderate amount of fluid escaped on removal of the brain. At the base the membranes were normal. The carotids were stiff and atheromatous; vertebral and basilar arteries in the same state. Nerves at the base normal.

Cortex: Pia moderately injected; the posterior part of the left hemisphere looked fuller and the convolutions were paler than on the right side. This was particularly marked on the parietal and temporal lobes, portions of which look softened. More accurately determined by sight and touch, the superficial soft areas were as follows:

1. The entire supra-marginal and the lower part of the angular gyri.
2. The posterior part of the first and second temporal gyri, which bulge distinctly, and the veins of which are much distended.
3. The two annectant convolutions joining the first temporal gyrus and the parietal convolutions, only evident after separation of the fissure of Sylvius.

Though these parts were softened and contrasted by touch, in a marked manner, with the rest of the brain, superficially they did not look very different, and were only a little paler in color.

The cortical arteries were stiff, and when slit open were found free to the finer ramifications. They presented occasional flakes of atheroma and recent soft blood-clots, but no thrombi. The posterior cerebrals presented several atheromatous patches. The branches passing to the cuneus were free. The lateral ventricle was not distended on the left side. The caudate nuclei and thalami looked normal. On the outer wall of the left ventricle, just at the point of divergence of the descending and posterior cornua, there was a grayish-white swelling, presenting congested bloodvessels here and there, and which looked like a region of thrombotic necrosis; behind, it extended into the posterior horn, anteriorly it did not reach the pulvinar. The ependyma of the posterior horn was soft, but the deeper white matter of the lingual gyrus and of the convolution at the junction of the parieto-occipital and calcarine fissures was not involved to any depth.

The organ was injected with and hardened in Müller's fluid, and then horizontal sections were made.

Section 1, half an inch above the corpus callosum.

The white matter of the centrum ovale on the left side presented a slight reddish-brown color in the fibres of the parietal lobe.

Section 2, at level of the corpus callosum.

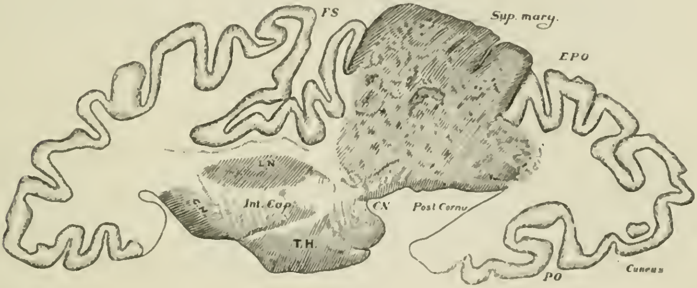
An area of softening in the posterior-external part of the centrum ovale of about four centimetres in antero-posterior extent. Externally, this section passed through the angular gyrus, the gray matter of which was firm, but the white matter was uniformly softened.

Section 3, at the level of the middle of the basal ganglia.

The softening occupied a large area between the posterior horn and the middle of the outer aspect of the hemisphere, involving the entire white matter of this region (see figure). Anteriorly it reached to the posterior part of the internal capsule, which appeared somewhat softened but not changed in color. Posteriorly, the softening did not extend behind a line drawn across the level of the parieto-occipital fissure. The white matter of the occipital lobe was firm, and the gray matter of the cuneus was uninvolved.

Section 4, passing through the outer third of the left crus.

FIG. 2.



Transverse section of left hemisphere passing through supra-marginal convolution, showing the area of softening. F. S., fissure of Sylvius; L. N., lenticular nucleus: C. N., caudate nucleus; C. N., tail of caudate nucleus: Int. Cap., internal capsule; T. H., optic thalamus; P. O., parieto-occipital fissure; E. P. O., an external parieto-occipital fissure (?); Sup. Marg., supra-marginal gyrus.

The softening is more extensive. It reached nearly seven centimetres in the antero-posterior direction, extending anteriorly, and just involving the fibres behind the end of the lenticular nucleus and the tail of the caudate nucleus, where it passed into the descending cornu. Posteriorly, the white fibres of the occipital lobe were not involved. Internally, the softening reached to the ependyma of the posterior horn, which was dark in color. Externally, it touched, but did not involve the gray matter of the convolutions.

The internal capsule, the lenticular nucleus, the thalamus, and the crus seemed normal.

Section 5, at the level of the upper margin of the uncinate convolution.

Large area of softening, two inches in thickness and one in breadth. in the temporo-sphenoidal lobe, reaching to within two inches of its apex. Externally, it touched the gray matter of the third and the base of the second temporal gyri.

The corresponding sections of the other hemisphere were normal.

The softened area has a grayish-yellow appearance, interspersed with patches of extravasation. It appeared to be ordinary necrotic change. The vessels were carefully withdrawn; no miliary aneurisms were found, but many of the smaller ones were blocked with thrombi. At the lower part of the temporo-sphenoidal lobe the margin of softened area was unusually firm. The branches of the posterior cerebral artery were free.

The drawing was made from a section which passed through the lower portion of the supra-marginal gyrus, at half an inch from the termination of the Sylvian fissure. The softening here was more superficial than at any other point, and seemed to involve the gray matter. In the posterior part of the first and second temporal the softening reached to the gray matter, but did not enter it. In the section from which the drawing was taken a deep fissure is seen, which crossed the hemisphere, and seemed to separate the parietal and occipital lobes. The angular gyrus lies at a higher level than shown in the section; the white matter of it was softened, but the gray looked very natural. The drawing is an exact representation of the specimen, made by placing tracing-paper upon the section.

UNUSUAL COMPLICATIONS IN ENTERIC FEVER.

By James Finlayson, M.D.,
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I.

Abortive Attacks, occurring in Fever Epidemics, not free from Danger.

In outbreaks of infectious disease in institutions, or otherwise affecting special groups of people, it is not uncommon to find a certain number of abortive attacks, or of obscure and indefinite illnesses, the nature of which can only be recognized in view of the circumstances under which they occur. In the unfortunate outbreak of enteric fever amongst the nurses, servants, and patients of the Glasgow Western Infirmary which occurred in August, 1884, the infection was traced with complete precision to contaminated milk. (See *Report by the Medical Officer on Outbreak of Enteric Fever in Royal and Western Infirmaries, and Fever Hospital, Belvidere, Glasgow, in August*, 1884: Glasgow, 1884.) In this outbreak we had various illustrations of these abortive attacks—slight febrile attacks for two or three days, with complete recovery. Unfortunately, however, we had one case, apparently the most trivial of the whole group, which subsequently proved fatal. This girl, a housemaid, had been, like many others, feeling poorly for nearly a week, with slight shiverings and squeamishness, but she was at work up till September 4th; next day she was put under my care, when her temperature was found to be 102.2° F. Her menses came on next day, her temperature fell to the normal and remained so. She was, however, kept under observation, but was allowed up on the 9th, as she seemed quite well; the temperature was taken regularly till September 14th, and was always normal. She still, however, was kept in the ward, although not regarded as a patient; but on the 20th and 21st she felt ill, with headache and sickness, and her temperature on the 21st, at night, was 103°. The case proved a bad one from the beginning, going on with persistently high fever till death on October 18th. We had here, as I take it, a fatal relapse, proving the first trivial illness to have been due to veritable enteric fever, although in the absence of any such relapse one could hardly have regarded, as more than an abortive febricula, a febrile attack which subsided completely the day after she took to bed.

In the fever patients under my care in this epidemic, there were many recrudescences and relapses; probably the way in which the fever was contracted accounted for different doses of the poisoned milk maturing at different times. In one of the other patients, a relapse occurred just at the same time that this girl began with her second and fatal illness. The peculiarity in this case was the extremely short and slight initial illness, contrasting with the obvious gravity of the second illness or relapse, if it may be called so, which declared its seriousness from the beginning.

II.

Obscure Illness, with little or no Pyrexia, obviously from the Enteric Fever Poison; Complication of Carbuncle, followed by Blood-poisoning and Death.

A professional gentleman, over fifty years of age, residing at Helensburgh, had a series of illnesses in his family there. Some of those affected recovered after a short febrile illness of an obscure character; but one, a girl of about seventeen, had a somewhat alarming attack, undoubtedly due to enteric fever. It was to see her that I was sent for; after an anxious illness she made a good recovery. While there, however, my opinion was sought as to the state of my friend, her father. He had been, for a fortnight or more, "seedy," obviously quite unfit for work, but without any definite symptoms, without recognizable disease of any of the organs, and without pyrexia. His temperature had been carefully taken by his attendants and was never much, if at all, over 99° F. This was on March 13th. At my request, it was taken even more critically at nights, but without discovering any elevation of temperature. I could only agree with my medical friends, that such an illness, occurring under such circumstances, was to be regarded as due to the enteric fever poison, and that he must be watched carefully, and all precautions taken, to avoid accidents or aggravations.

After a little longer tedious waiting, the illness cleared away, but his recovery was hindered by the occurrence of a carbuncle at the back of his neck. Before very long, however, this discharged its contents and began to heal up, and in point of fact it was almost healed when alarming, and, as it proved, fatal symptoms supervened. These were characterized by fever, with at first special development of urinary symptoms characterized by hæmaturia, evidently of renal origin, and scanty secretion of urine so marked that the possibility of retention was entertained and catheters passed without relief. I saw him in this condition on April 19th, and, although regarding the case as grave, I thought the renal congestion might pass off; I could not see him again; but further alarming symptoms supervened, and he died on the 22d, just as his daughter was beginning to recover. There was no post-mortem examination, but from the details of the symptoms given to me, there was no doubt in my mind that the case was due to some septicæmic condition or blood-poisoning, a recognized, though happily rare, complication of carbuncle.

III.

Convulsions, presumably Uræmic, about the Seventeenth Day.

The first death which occurred in the epidemic of fever amongst the nurses in the Western Infirmary, already referred to, was in a nurse twenty-three years old. She had a shivering on August 27th. She had pretty high fever, with slight diarrhœa, about September 4th. One or two doses of one-half grain of opium were given, and on the morning of September 9th her bladder was found much distended, and a large quantity of urine was drawn off, which, however, was thrown away without being tested. On September 10th she had some sickness and retching, and a loose motion was passed under her, without notice, at night; a little twitching at the wrists was noted. The urine was now found to be highly albuminous, and under the microscope there were very numerous granular and hyaline tube-casts. By September 12th the tremulousness and twitchings at the wrists had increased, and the muscles of the head and neck became involved; these tremors, for a short time, were accompanied by an alarming condition, with extremely bad and intermittent pulse. The bowels were somewhat looser than before, and so a lead and opium pill was given, with apparently some benefit. About 3 A. M., on the 13th, the nurse in attendance was alarmed by the patient making a convulsive clutch at her, and both arms and legs became rigid; the face also was found to be convulsed. She seemed quite unconscious during this convulsion, which lasted about ten minutes. The patient regained consciousness and rallied from this attack, but the high fever and typhoid aspect did not abate; there were also deafness, abdominal distention, and diarrhœa. On September 15th she had fits of trembling, the breathing became rapid, and she died with a temperature of 108° F. on the night of the 16th.

The urine was drawn off twice a day from the time of the first retention; its quantity was about 35 ounces or more in the twenty-four hours, and the specific gravity about 1020 to 1025. The tube-casts continued to be present in enormous quantity, the hyaline casts containing faint granular matter. There was no post-mortem examination.

IV.

SMALL BLACK SPOT OF GANGRENE ON THE SOLE OF FOOT, APART FROM PRESSURE. RIGORS BEFORE DEATH.

A nurse, about thirty years of age, was sent to bed on September 8, 1884. The illness was a severe one from the beginning, with much nervous disturbance, high temperature, abdominal pains, and diarrhœa. Some intestinal hæmorrhage was noticed on October 2d, and repeatedly thereafter, sometimes in considerable quantity. Great feebleness and prostration came on, and she was put on a full-sized water-bed on October 6th, there being some redness of the back and a very small sore; this, however, did not increase, but rather improved, although the patient became worse. Next day, slight discoloration of the heels on their outer aspect was detected, but it was not very deep in color or extensive. The following day (October 8th) the fingers were dusky, and some dark discoloration of the dorsum of the feet was seen, and a small black spot appeared on the sole of the left foot, toward the outer aspect, but the skin remained quite whole in the feet till the end. The case was also complicated with cystitis. On October 13th a severe rigor occurred, and the breathing became very bad. During the next day another violent rigor occurred, and she died in the evening. These shiverings suggested pyæmic complications, but nothing more definite can be said about them.

In this case the discolored heels might perhaps have been ascribed to pressure in a debilitated subject, affecting a part of low vitality, although the area of blackness was on the outer aspect rather than the part pressed upon. The discoloration of the dorsum of the feet, however, pointed to the blackness depending on something different from pressure, although, perhaps, the weight of the bedclothes might be alleged, even here, as a source of pressure. The small spot of black gangrene, however, on the sole of the foot seemed to indicate the presence of a process quite unconnected with pressure, and this occurrence is adduced here as pretty positive proof in this case of what is often suspected in others, although (as in the case of the black heels) the influence of pressure can but seldom be clearly eliminated.

It should, perhaps, be stated that ergot of rye was used in this case pretty freely for the intestinal hæmorrhage; and, although it was not thought possible that the gangrenous spots could be due to this agent, it was deemed wise to stop it when the black spot appeared. This could be done the more willingly as any beneficial influence from its use on the bleeding in this or other cases was extremely dubious.

V.

ALARMING NERVOUS DISTURBANCE DEVELOPED WITH THE SUBSIDENCE OF THE PYREXIA.

A tablemaid in the Western Infirmary took ill on September 4, 1884, and the fever subsided on the 10th. A relapse began on the 21st or 22d, and during this relapse the temperature reached 104° F. on several days, but by October 2d it seemed as if defervescence had become established, as the temperatures only reached about 100°. All through these two attacks of pyrexia there were but few nervous symptoms, although on September 30th and October 1st, with a declining temperature, the patient was delirious, practically for the first time. On the 3d of October, and for several days thereafter, the catheter had to be used. Low muttering, with a tendency to get out of bed, now came on, and she had all sorts of terrible visions. There was also a very curious shaking and tremor of the head, with quivering in the face and eyelids; these movements of her head and eyes seemed to give rise in her mind to the idea that her attendants were staggering. When spoken to, she became quieter and answered quite nicely and sensibly, but soon relapsed into her muttering and quivering. No explanation was found in the state of the urine, which was secreted in moderate quantity and it contained no albumin. Along with this muttering and quivering there was complete sleeplessness. On October 2d a little brandy was tried, but it did not improve her. On October 3d a dose of Battley's Sedative Solution of Opium was given, and she slept an hour and a half, and on the afternoon of the 4th, after 20 minims, she again slept a little, and it was repeated at night; after this she slept four hours quietly, and was calm and settled in the morning. Some abdominal pain, complained of on October 5th, although alarming at the time, proved to be due to the menstrual period coming on. During the 4th and 5th of October she had been lying a little more prostrate than formerly, but even then she frequently lay on her sides, and even got up and tried to get out of bed at times; no such attempts occurred on the night of the 5th of October.

Between the morning of the 5th and the morning of the 6th a large bedsore formed near the sacrum, or rather at the edge of the right buttock; it measured 2½ inches in diameter. The temperature was not over 100° F. The nervous system seemed quiet. The case went on without any special symptoms. Once or twice she passed water without notice after she had begun to tell when about to do so, and once the temperature rose to about 103° F., but this was probably due to the bedsore. A trace of albumin appeared occasionally in the urine. The slough in the sore began to separate on October 11th, leaving a deep ulcer, but it gradually contracted and was nearly healed by November 14th.

In this case we had the appearance of grave nervous symptoms during the decline of the pyrexia, reaching their most alarming phase when the patient might be regarded as almost over the attack; the gravity of these symptoms was emphasized by the remarkably rapid development of a large bedsore. No doubt the explanation was to be sought in the poisoning of the nervous system from the circulation in her blood of effete products resulting from the fever, even although no albuminuria existed at this time. I have seen somewhat similar conditions, once or twice, in pneumonia—the patient passing through the height of the fever in this disease with little or no delirium, and becoming violently delirious or maniacal after the supervention of the crisis.

VI.

Double Periostitis with Necrosis.

A cleaner in the Western Infirmary, aged eighteen years, took ill with enteric fever on August 30, 1884. She had an alarming hæmorrhage, with three bloody motions, on September 5th, but she seemed to be getting over the fever on the 8th. On the 10th or 11th a relapse occurred, which underwent a favorable defervescence on October 1st or 2d. On October 20th some elevation of temperature occurred, and this was associated with pain in the right leg about two inches above the external malleolus, and this had been complained of for a day or two before. In this situation an old sore had existed seven years before, and it had discharged for a year. A few days later, swelling and tenderness appeared over the right tibia, evidently due to periostitis. About the same time some tenderness was noticed over the left tibia also. With this, great pain was complained of; the temperature ran up to 103° or 104° F. on the 27th and 28th. She was now removed to a surgical ward, under the care of Dr. Hector C. Cameron. The abscesses over both tibiæ were opened on November 12th, and bare bone felt in each; a third periosteal swelling, in the lower end of the femur, subsided without coming to an abscess. On March 3d Dr. Cameron removed, without difficulty, sequestra from both tibiæ. Some further portion of dead bone seemed to demand removal in May, but the patient and her friends insisted on her dismissal, and so the further course of the case cannot be traced.

A point worthy of note in this attack of periostitis was the occurrence of very acute symptoms at the beginning; not only severe pain, but also very high fever (103° or 104° F. on the 27th and 28th of October). In periostitis occurring as a sequela of enteric fever, surgeons have remarked on the absence of the fever and severe symptoms common in acute necrosis. Another point of interest in this case is the history of an old affection in the leg, presumably the result of scrofulous disease many years before the enteric fever, although the position of the symmetrical periostitis in the tibiæ was different from the old scar. (See an article by Dr. Hector C. Cameron, "Cases Illustrating Some Unusual Forms of Necrosis": *Glasgow Medical Journal*, August, 1881, vol. xvi. p. 107; in this article he quotes from Sir James Paget's essay "On Some of the Sequels of Typhoid Fever.")

VII.

GANGRENE OF THE LUNG.

A lady, about forty years of age, spending her holiday in Scotland, was seized with an acute illness in passing through Glasgow about the third week of September, 1889. This proved to be a severe attack of enteric fever, with high temperature and latterly intestinal hæmorrhage. From the first time I saw her in consultation, on September 30th, there were signs of congestion and partial consolidation of the right lung. There had been a little blood in the sputa, but a somewhat free hæmoptysis took place on October 6th, and on one or two subsequent occasions. As already stated, intestinal hæmorrhage occurred, and the danger from this seemed to be subsiding; but, toward the end of October, the breath and expectoration were noticed at times to be very offensive, and the unmistakable odor of gangrene was only too certain for a few days before her death on November 2d.

VIII.

PARALYSIS AND ANÆSTHESIA OF THE LIMBS AFTER RECOVERING FROM ENTERIC FEVER.

A mason, twenty-nine years of age, was sent to the Western Infirmary to be treated for paralysis. He had had enteric fever in the month of September, 1881; the attack was severe, and toward its close he seems to have experienced a benumbed sensation in his legs below the knees. On recovering, toward the end of November, he was able to go about for some three weeks, although with a feeling of coldness and stiffness in the legs, and during this period he seems to have been exposed to wet weather. The weakness in his legs became worse, so that he had to lie up, and after this his hands became weak also, and rapidly became so useless that he could not feed himself. On admission, in January, the muscles of both upper and lower limbs were found to be wasted, especially the extensors in the forearm. There was also marked anæsthesia in the legs and feet, and to a less extent in the hands, arms, face, and trunk of the body. Excessive tenderness existed on handling the feet and the legs. There was a complete inability to stand; and, while lying on his back, he could not lift the legs off the bed, although he could flex the limbs at the knee to some extent. He could scarcely lift the hands up to the head, and the power of using the fingers for buttoning his shirt was quite lost; the grasp of the hands was also very feeble. No response occurred on tickling the soles of the feet: the cremasteric reflex was present; knee-jerks absent; no ankle-clonus. There seemed to be no paralysis of the bladder, although a little wetting of the bed occurred once or twice, apparently from his helpless condition. No response of the muscles of the arms and legs, even to strong faradic currents, could be obtained, while with the galvanic current it was only obtained with difficulty. Soon after admission a small sore appeared on his right scapula, from pressure evidently, but it soon healed with care.

The treatment consisted in the use of electricity, both currents being employed; and some tonic with strychnine was given.

He was admitted on January 10th, and by February 10th he could stand, if well supported; in a fortnight more he could walk with the support of a chair, and in another fortnight he could walk quite alone. The response of the muscles to the electricity improved concurrently and became normal, and the sensation likewise recovered.

His previous health had been good physically, but there was some history of mental aberration, at one time, and his intelligence was a little deficient at the best.

He was reported, two years later, to have kept well and to have gone to America.

IX.

CONCURRENT DEVELOPMENT OF ENTERIC FEVER AND TUBERCULAR MENINGITIS AND PYELITIS.

A young English gentleman, about twenty years of age, who was learning shipbuilding and engineering in one of the works on the Clyde, took ill, and after a day or two his illness became so alarming that I was asked to see him in consultation; he was supposed to have meningitis. I found him in a curious dazed state, with a vacant or distant expression, repeating in a clear voice various figures, say 1230, corrected quickly or hesitatingly into some other figure, and this going on for minutes together. I was so much surprised and interested that I sat at the edge of his bed watching his face and eyes. All of a sudden, his expression changed; he saw a stranger, and asked what I was doing there, and seemed offended. I said I was merely asking his name; he gave it correctly, hurriedly adding, "That is the name on my card." I asked where he was working, and he said, "Barclay, Curle & Co"; not catching the name of the firm, he repeated it, and when I did so after him, he mimicked my Scottish trilling of the letter "r," and commented on the pronunciation. Immediately thereafter he relapsed into his figures and calculations as before, with the same far-off look, and seemed to be unaware of anyone's presence. He was reported to me to have no pyrexia, but on taking his temperature that day we found it high. No signs of disease existed in the lungs. On examination, the bladder was found distended, and as it seemed important to ascertain whether the urine contained albumin, I waited till his doctor sent for his catheter and drew off the urine. It was perfectly clear, and contained no albumin. This was on September 13, 1884. I could only regard the illness as due to some inflammatory affection of the brain. When seen, however, next day and in a day or two later, it was found that his mind was much clearer, and, on the other hand, that his temperature was persistently high. We now encouraged his mother to believe that the alarming cerebral symptoms, owing to which she was sent for, might be due to the disturbance of enteric fever and not to meningitis. The case developed with abdominal symptoms in such a way as to lead to there being no doubt in my mind that the illness was due to this fever. There were, indeed, puzzling complications in the urinary organs, with pain on micturition, and blood and pus in the urine, beginning soon after the catheterization, and (as I had not used the catheter myself) I not unnaturally ascribed the disturbances to some accident from this cause. The state of the bladder and the painful micturition probably caused him to scream out at times, and to become somewhat rigid, but we hoped the bladder would improve with the subsidence of the fever, or at least that more efficient treatment of it would then become possible. By October 3d—that is, about the end of the third week—the temperature, previously declining, became normal and remained so. Although carefully nursed and fed, he had become very thin, and some discolored blotches appeared on the left side on September 26th. With the subsidence of the fever my fears as to the case were allayed, and frequent visits on my part seemed unnecessary; feeding up seemed the only thing required. On going back, however, after eight or nine days' absence, I was startled to find him wasted to the most extreme degree, perfectly free from fever, but with more of the obscuration of the intellect, coming, at times at least, quite suddenly. Nothing further could be found to explain his condition except the state of the urine, with pus and blood, and obviously great pain in passing it. The cerebral symptoms, however, seemed again too distinct to be ignored, and I had once more to revise my diagnosis, saying that the patient had evidently meningitis, as at first stated. He died on October 15th.

Before the post-mortem examination, I stated to Dr. Joseph Coats, who made it, that I believed we had had both meningitis and enteric fever in the case; but I could not think of any proper explanation of the extreme emaciation, or of the urinary symptoms.

The examination showed the intestinal ulceration characteristic of enteric fever, but the ulcers were far advanced toward cicatrization; they were quite clearly *not* of the tubercular form. There was perfectly distinct and typical tubercular meningitis, and extremely advanced forms of tubercular disease in the kidneys and the bladder.

The tubercular disease of bladder and kidney at once explained both the wasted appearance and the urinary symptoms. The perfectly-clear character of the urine at my first visit had kept me from thinking of this; the disease was no doubt present there long before that, but probably underwent rapid development after the catheterization.

The combination of symptoms of meningitis with those of the fever was most perplexing. The meningitis seemed to be so far arrested in its progress by the development of the fever, and reasserted itself with its subsidence.

DISEASE OF THE MID-BRAIN REGION,

WITH SPECIAL REFERENCE TO OPHTHALMOPLEGIA, AND A NOTE ON POST-HEMIPLEGIC ATAXIA.[1]

By B. Sachs, M.D.,
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It is my intention in this paper to analyze as briefly as possible a number of cases in which oculomotor symptoms have played an important *rôle*. I have been fortunate in obtaining two autopsies which furnished good proof of the value of those symptoms commonly supposed to indicate disease of the mid-brain region, and several other cases that were subjected to careful clinical examination, will help to enforce the points which I wish to make.

It is only within recent years that the mid-brain region has acquired great clinical and practical value. This is due largely to the anatomical and pathological studies of Westphal (¹), Spitzka (²), Leube (³), and Wernicke (⁴), who have taught us to discriminate between the various subdivisions of the oculomotor nuclei, and have given us anatomical explanations of the many and complicated phenomena in polio-encephalitis superior (Wernicke), and in other conditions associated with ophthalmoplegia externa and interna.

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[1] Read at the meeting of the American Neurological Association, 1890.

Among other things, I wish to show that we should not be too ready to make the diagnosis of polio-encephalitis superior wherever and whenever partial ophthalmoplegia (external and internal) constitute the main symptoms of the affection. A diagnosis hastily made is often badly made.

Case I.—My first case is one of unusually severe tubercular affection of the brain in a young child. The main points of the history, which I have been able to complete through the kindness of several colleagues, are these:

The child, E. S., aged three years, was first seen about the middle of November, 1889, by Dr. J. A. Meeks, in the Eye and Ear Department of the Northern Dispensary. At that time the little girl had double ptosis, but no other ocular paralysis was observed. The child was dull and listless. The pulse ranged between 165 and 160, but the temperature was normal. She was referred to the care of Dr. Seguin, at the Manhattan Eye and Ear Hospital, where Dr. Booth[1] took a very careful history. From his notes of December 9th I gather that the mother had noticed a change in the child's disposition since an attack of measles in the previous April. The child did not care to play with other children; preferred to sit quietly by herself all day long; staggered in walking, and occasionally fell. The child had no epileptic attacks, and had vomited but once. At this time (December, 1889) the child was stupid and deliberate in all her movements; walked with her feet widely apart; no staggering; very little strength in the hands. Right hand weaker than left. No anæsthesia or ataxia; knee-jerks absent. Paresis of both levatores palpebrarum, the pupils being half covered; no other paralysis of ocular muscles. No nystagmus. Pupils equal, moderately dilated, reacting to light and during accommodation. There was at this time a suspicion of optic neuritis. Pulse 140, and temperature of axilla 100.2°.

The child was brought to my department at the Polyclinic December 28, 1889. It was not known at the time that she had been seen by Drs. Meeks and Booth. A careful examination of her condition made before the students of the Polyclinic showed that there was double and almost complete ptosis. There was no upward or downward movement of either eye; both internal recti muscles were thrown into a clonic spastic condition when an attempt was made to use them. Both internal recti were capable of very slight movements, but all other external ocular muscles were completely paralyzed. Yet, strange to say, even at this late day the accommodation reflexes were distinct, and there was slight contractility to light in both pupils. A slight left facial paresis was noticeable. Vision was very much impaired. Although in a condition of semi-stupor, the child walked before the class, and exhibited in so doing most distinct staggering, which reminded one of typical cerebellar gait. She walked with a broad base, and showed distinct tendency to fall to the right side. The oculist (Dr. Webster) reported a distinct plaque of choroidal atrophy below the macula of the left eye. The reflexes were exaggerated, and there were very evident occipital headaches. The right hand was weaker than the left, but otherwise the use of all four extremities was entirely normal.

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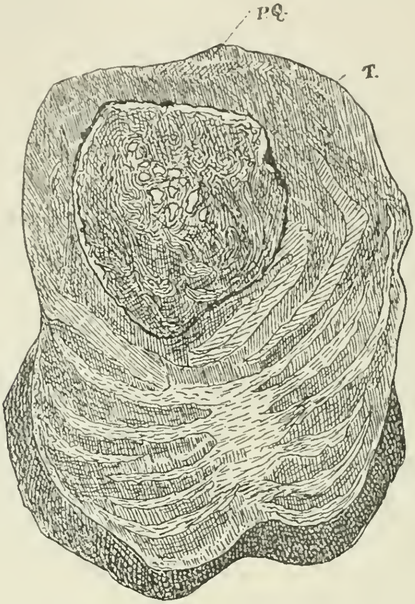
[1] I am indebted to Dr. Booth for his kindness in putting the hospital records at my disposal.

The diagnosis of tumor of the corpora quadrigemina was made, and this tumor was supposed to be associated with a general tubercular meningitis. While the ocular symptoms pointed to the region of the corpora quadrigemina, the subacute character of the onset, the involvement of the sixth and seventh nerves, the weakness of one upper extremity, and the occipital headaches, indicated a general and widespread cerebral affection. The tubercular character of the disease was diagnosticated from the general cachectic appearance of the child, from the peculiar development of the symptoms in the last weeks, and from the information given us, that an uncle of the child had just died of phthisis.

The child grew rapidly worse, and could not be brought to the clinic. At my request Dr. Peterson kindly visited the child at its home and kept track of it to the end. The child had occasional convulsive seizures, grew blind, became comatose, and two weeks before death developed left hemiplegia. There was no change in the eye symptoms, unless the light and accommodation reflexes disappeared, but this point could not be positively determined, owing to the comatose condition of the child. The child died February 4, 1890, four months after the onset of the symptoms.

By strategy and Dr. Peterson's persistence an autopsy was obtained, and the brain was removed by him. The dura was adherent to the skull, and had to be removed with the calvarium. The quantity of subdural fluid was slightly increased. There was discovered at once a tumor (solitary tubercle) near the right lateral sinus, about one centimetre in diameter and pressing upon the lateral edge of the cerebellum, producing thrombosis of the lateral sinus. Other tubercles surrounded by large areas of softened tissue were found in the cerebellum. An examination of the brain at my leisure showed that the hemispheres were healthy, with the exception of small tubercular deposits along the bloodvessels. The cerebellum was the seat of most profound changes, containing several large solitary tubercles. At the base there were several uncommon conditions; there was an unusual thickening of the pia, with small tubercular deposits between the corpora mammillaria and the optic chiasm, and in the interpeduncular space, the thickening here being so great, though probably of recent date, that both third nerves, instead of lying across the crura, after removal of the brain, pointed backward, and the right sixth was twisted out of its normal position. The brain was not cut into until it had hardened for about a week in a two-per-cent. solution of bichromate of potash. Cutting through the level of the corpora quadrigemina a tumor was found, as anticipated, the size of which will be best appreciated by an examination of Fig. 1. The brain was allowed to harden for many weeks in bichromate solutions of increasing strength, and later on in alcohol.

The sections were made from parts embedded in celloidin, and variously stained. It will be observed that there is no trace of the aqueduct of Sylvius in sections passed through the anterior quadrigeminal bodies, while in sections through the lower half of the pons one can observe the increased dilatation of the ventricle.[1] There is every reason to suppose, from a comparison of the symptoms and from the study of the anatomical specimen, that the tumor began to grow from the central gray substance. The tumor occupies almost the entire tegmental division of the crus, and has left only a very small portion of the corpora quadrigemina and the brachia intact.



Vertical section passing through the posterior quadrigeminal bodies.
T. Tumor. PQ. Posterior quadrigeminal bodies.

Reviewing the history of this case, and comparing the clinical symptoms with the results of the post-mortem examination, we are struck by the fact that the one solitary tubercle in the vicinity of the corpora quadrigemina produced more mischief than the large number of lesions elsewhere in the brain. The occipital character of the headache, and the cerebellar staggering, are the only symptoms which can be ascribed to the tubercles in the cerebellum, though both these symptoms might be due to disease of the quadrigeminal region. Indeed, Nothnagel (5) has recently claimed that cerebellar walk and nuclear affections of the oculomotor nerves are the most distinct symptoms pointing to disease of the corpora quadrigemina. In this he has been supported by the few authors who have reported cases since the publication of Nothnagel's article, notably by Alfred Christ (6) in an able paper on this subject.

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[1] Further anatomical details are omitted.

If we consider the intimate anatomical relation between the corpora quadrigemina and the cerebellum through the anterior peduncles of the cerebellum, there is nothing surprising in the fact that cerebellar staggering should be a symptom common to disease in both of these regions. In this case it will be impossible to determine whether this one symptom was due to disease of the corpora quadrigemina or to the involvement of the cerebellum; but, inasmuch as the ocular symptoms preceded all other symptoms for some considerable length of time, it is safe to say that cerebellar staggering is not one of the *early* symptoms of disease of the quadrigeminal bodies, though it is undoubtedly a symptom that is developed in the later stages of such disease. An examination of sections through the pons showed that the sixth and seventh nerve nuclei were entirely normal; they can, therefore, not be held responsible for symptoms pointing to involvement of these nerves, but this must unquestionably be placed to the account of the basilar meningitis.

Certain it is, that this meningitis was not the cause of the oculomotor symptoms; for months, or at least for weeks, the symptoms were distinctly nuclear; both levators were affected long in advance of other muscles, and the internal recti muscles retained some function long after the other muscles supplied by the oculomotor nerves had been completely paralyzed. In spite of the manifold morbid conditions, it is most remarkable of all that the ciliary muscles and the sphincter iridis should have remained exempt during the entire period of observation—a striking proof of the fact that the nuclei of these two muscles are at some distance from those governing the other and external muscles. Moreover, the fact that the levatores palpebrarum were affected to the exclusion of other muscles for a long time would point to the main cell-nests of the third nerve nuclei as the original seat of the tumor. Whether the tumor invaded both sides at once, or whether the decussating fibres from the main cell-nests are responsible for the bilateral character of the nuclear symptoms cannot be determined by cases of tumor.

The chief inference to be drawn from this case is that symptoms of ophthalmoplegia externa and interna, if associated with symptoms pointing to a new-growth within the brain, will serve to locate that growth in the vicinity of the corpora quadrigemina.

Considering the compactness of all cerebral structures in the mid-brain region, one would expect that there could not for an instant be any difficulty in making a differential diagnosis between cases of tumor of this region and a chronic inflammatory process. One would expect a far greater number of pressure-symptoms in the former than in the latter instance, yet the following case will serve to illustrate this difficulty:

Case II.—In August, 1889, I was asked by the late Dr. Cocks to see Mrs. L., aged forty years. She had been married for many years, but had never been pregnant; was always in excellent health until five years ago, when she began to be troubled with headaches and vomiting, cerebral in character, and a peculiar sensation in the head on looking upward. At the same time she noticed that she saw things double, particularly on the street and on looking through an opera-glass. These symptoms had continued, with slight intermissions, up to the day of examination, except that the paresis of the eyes had very much increased. She was in the habit of keeping the left eye closed altogether, in order to have single vision. Had vomiting-spells occasionally, and some few fainting-spells many years ago, which may have been due to profound anæmia. My examination was entirely negative, except as regards the eyes. There was marked paresis of both internal recti in united and single action; external recti act fairly well, but nystagmus movements result if the attempt is made to bring the eye to the outer canthus. Upward movement of the eyes barely possible; downward movement also limited. Pupils react normally to light and during accommodation. Ptosis is said to have existed, but is not present now. Knee-jerks normal, and sensation absolutely so. At this time I made the diagnosis ophthalmoplegia nuclearis externa, probably due to a polio-encephalitis chronica, but remembering the occasional vomiting, I mentioned the possibility of tumor; not really believing it, however, but yet feeling disposed to give the patient the benefit of the doubt, I urged the continuance of active mixed treatment.

The further course of events was rather surprising. About two months after I had seen the patient for the first time, I had the privilege of examining her again. She was troubled severely with headaches and vertigo, and had been alternately drowsy and wakeful. In addition to these symptoms, she developed incoördination and characteristic cerebellar staggering. On October 5th, Dr Cocks reported to me that he suspected optic neuritis; and on October 17th there was very marked double optic neuritis, and the patient was no longer able to stand without support. The symptoms of tumor were so distinct that the idea of a polio-encephalitis superior had to be abandoned. The patient died October 31st, having become almost blind and wholly unable to leave her bed for some days before death. In spite of the most strenuous efforts, the husband refused an autopsy.

The idea of tumor in this case can scarcely be rejected, yet no one, I think, would have supposed that for more than five years the growth of the tumor in this region would be so gradual as to affect certain cell-nests only, and not the entire nuclei; for it will be remembered that the sphincter and ciliary muscles were entirely free as long as a detailed examination could be made. If asked to carry the diagnosis still further, it would be fair to say that there may have been a gummatous infiltration of this region, as has been found in other cases, notably in one of Thomsen's (7); that this increased very slowly, diminishing at times and again growing anew, thus bringing about a chronic and variable group of symptoms. This inconstancy[1] of symptoms in specific disease of the cerebral nervous system has been correctly insisted upon by Dr. Oppenheim (^{8}), of Berlin, in a very able discussion of the subject. In the case I have just discussed there is still another possibility—there may have been a mere gummatous infiltration of the oculomotor nerves which caused symptoms resembling those of nuclear disease, and toward the latter part of the disease the growth of a large gumma may have given rise to those symptoms which pointed so clearly to the development of a neoplasm.

But whether we had here to deal with gumma or mere gummatous infiltration, it is important to note that the manner in which the case terminated disproved the diagnosis of polio-encephalitis which for months, if not years, was the only safe diagnosis to make.

In this connection I am reminded of the difficulty of diagnosis in still another respect: since our anatomical knowledge has been worked out to the finest details, it is a point of some practical value to diagnosticate the character of the morbid process. Syphilis—ocular paralyses, gummatous infiltration of the base—is the natural sequence of our thoughts in many cases, and yet the symptoms which we observe frequently make it difficult to determine whether the disease is of nuclear origin, or whether the oculomotor root-fibres are affected by specific disease of the base of the brain. The following case will illustrate this point:

Case III.—During many months, Dr. Gruening, who was kind enough to refer the patient to me, and myself, have had repeated occasions to examine a young gentleman from the western part of New York State. The patient is now thirty-three years of age, single; his family doctor reports that he had chancre with secondary eruption fourteen years ago, was thoroughly treated, no trace of syphilis since that time. Has never had headaches, and extremely well otherwise. Has been a hard worker for years. A year ago returned from an extended tour abroad. During this tour had spent weeks on the Lybian desert, and is inclined to think that the glaring white sand (he never wore glasses) is the cause of his trouble. Shortly after his return he noticed that he began to see double and that his eyes drooped. My examination of the ocular condition brought out the following facts: Left ptosis covering three-fourths of pupil; eyelid can be raised a little by great effort. Reflexes to light and accommodation almost normal. Left pupil possibly a little sluggish to light. Left abducens completely paralyzed. All other movements of eyes are perfect, inward, upward, and downward. Dr. Gruening found swelling and redness of the left optic disk. The patient was placed upon a most vigorous course of the iodides, taking as much as one hundred and fifty drops of a saturated solution of the iodide of sodium three times a day for weeks. This he bore extremely well, his general health remaining excellent. His condition since has varied somewhat, the rectus externus of the right eye showing slight paresis at times, and then again disappearing.

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[1] And yet this statement should be accepted with some reserve, for in the case of glio-sarcoma reported by Christ (loc. cit.) the symptoms were variable enough.

After months of treatment, and several months during which treatment was entirely suspended, the condition has changed in some respects. The left eye is now altogether better than the right eye. The left ptosis has been considerably relieved. The left rectus externus brings the eye to within one-eighth of an inch of the canthus, and all the other ocular muscles have normal function, but now the right eye is worse. The right rectus externus can bring the eye to within one-fourth inch only of the canthus. Upward and downward movements are normal, but the right pupil responds very sluggishly to light, while it does fairly well during accommodation. Right ptosis is more marked than left.[1]

In this case it is worth noting that an actual improvement of the condition of the left eye set in some time after all anti-syphilitic treatment had been abandoned, and that, while the left eye continued to improve, symptoms set in in the right eye very like those of the other eye, which had been the starting-point of the whole trouble. The entire history of the case is in favor of the specific origin of this trouble, yet if we remember that there was ptosis of one eye, paresis of the rectus internus of the same eye, and involvement of the rectus externus, while the other muscles supplied by the oculomotor nerve remained intact, we see that we have a group of symptoms closely resembling those of nuclear disease. Yet I cannot conceive, in view of the marked improvement of the left eye, that such is the case, and we are therefore forced to the conclusion that a specific infiltration of the oculomotor nerves may simulate disease of the oculomotor nuclei. This would be a point of some importance in the differential diagnosis of those cases in which apparently nuclear symptoms occurred in individuals who give no history of previous specific disease.

Fournier(9), Rumpf(10), and Oppenheim(8) are all agreed as to the occurrence of partial ophthalmoplegia in cases of syphilitic disease at the base of the brain, and Thomsen's case shows that a nuclear paralysis can be simulated by a gummatous infiltration of the root-fibres.

I cannot help thinking that just as the larger peripheral nerves are mixed nerves, giving rise, under certain conditions of disease, to motor or sensory symptoms, and not necessarily to both, so the oculomotor nerve is a mixed nerve, and that certain diseases affecting the third nerve show a predilection for definite sets of fibres. The anatomy of the third nerve rootlets has not been so clearly studied that we can point out the fibres or sets of fibres going to each muscle of the eye; but there is already good reason to suppose that the innermost rootlets are those which represent the internal rectus. A comparison of this case with others leads me to believe that, while we should keep the possibility of nuclear lesion in mind in such cases as the one just described, a preceding history of specific infection, and the inconstant character of the symptoms, indicate specific disease of the third nerve roots, rather than of the third nerve nuclei.[1]

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[1] In Feb. 1891, the patient presented himself again. The ptosis of both eyes has disappeared entirely: the right eye is entirely well, and in the left eye there is nothing but a slight paresis of the rectus externus.

To the preceding cases we may add, properly enough, another in which the oculomotor symptoms were distinct, yet not so striking a feature as the peculiar disturbances of motion which lent a special interest to the case. The situation of the lesion in this instance is of special importance, by way of throwing some light upon the origin of post-hemiplegic disturbances of motion.

Case IV.—The patient was a married woman, fifty-seven years of age at the time of death, December 2, 1889. Very nearly seven years previously patient felt dizzy one morning and found her vision rather blurred. This condition passed away, but returned again after fifteen minutes. She remained seated in her chair, was not unconscious for an instant, and had no trouble whatever in speaking. She attempted to walk, found this rather difficult, but did not fall. The difficulty increased, and by the following morning she had almost complete left hemiplegia. She could not open either eye. The attending physician noticed, on raising the eyelid, that vision was dim. What the position of the eyes was at this time could not be ascertained. Speech was also heavy and indistinct, but from this the patient recovered within three weeks. There was no defect of any other special sense. The hemiplegia was never recovered from. Patient became somewhat unruly and demented, and was finally taken to the Montefiore Home, where she was an inmate for many years. As far as could be determined, patient had never had syphilis, but there was very marked atheroma of all peripheral arteries: the patient was prematurely old. In addition to her left hemiplegia, she also had lost the use of her right leg, which had been amputated above the ankle on account of necrosis of the tibia fully six years ago. Being bedridden, she was covered with a succession of sores, and was altogether a revolting sight. The right eye at the time of my first examination was completely closed, the globe was rotated so that the pupil stood in the extreme outer corner of the orbital cavity; there was not the least possibility of movement inward, upward or downward. The pupil was widely dilated; no reflex to light; accommodation reflex, of course, could not be tested. There was rigidity of the left leg, and increased knee-jerks on both sides. The wrist-reflex was decidedly increased on the paralyzed side, but this left upper extremity was subject to the wildest ataxic movements. I call them ataxic, for they remind me of the extreme ataxic movements of the legs in the last stages of tabes dorsalis. If our patient was asked to use the paralyzed hand, say, in order to squeeze the physician's hand, this paretic extremity was whirled about so violently as to be a source of some danger to those near the bed. After a little, the arm would fall down from exhaustion, and remain quiet until aroused again. The patient's condition grew worse during the latter half of the year; she became extremely emotional and demented, took very little nourishment, and finally died December 2d. She was not intelligent enough during the time I observed her to enable me to make satisfactory sensory tests. The diagnosis of crus lesion of right side, probably softening from thrombosis, was corroborated by the autopsy.

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[1] This conclusion is supported by other cases to which I shall refer in a later article.

The autopsy was made a few hours after death. The dura was found adherent to the skull; the pia could be readily removed from the entire surface of both hemispheres. Nothing abnormal about the appearance of the convexity. An inspection of the base of the brain revealed at once the small size and extreme softness of the right crus as compared with the left. The right oculomotor nerve was as thin as a thread, the left about of normal size. The vessels of the brain were carefully examined, and no changes were found except in the post-cerebral artery of the right side, which was plugged by a firm thrombus that had evidently been formed *in situ*. Beyond the thrombus the artery had been reduced to a mere thread. The brain was handled after Meynert's fashion, the ganglia being dissected away from the hemispheres. The cortex was found entirely normal, and in all the organs above the crus there was nothing of any significance. The brain was hardened in the usual way in Müller's fluid and alcohol. Every part except that which was the seat of the lesion hardened well. After the brain had become slightly hard, the crura were cut across, showing distinctly the absolute disintegration and atrophy of the right crus, the process having exceeded the middle line by a fraction of an inch. Sections were laid throughout the pons, medulla, and spinal cord; and, almost at every level, distinct degenerated fibres were found in the pyramidal tract and in both lateral tracts, yet the degeneration was not as pronounced as one might have expected from disease of such long standing. Sections of the right oculomotor nerve exhibited complete degeneration of the fibres, while the left third nerve also showed some degeneration on cross-section, though there were but very few fibres thus affected.

The occurrence of ataxic movements in cases of crus lesion is the one point to which I wish to call attention, while the ocular condition will serve to show how radically different the symptoms are in cases in which the entire nerve is affected by disease. The cortex and the sub-cortical ganglia were entirely normal, yet this peculiar disturbance of motion was like those we are accustomed to see in the wake of infantile cerebral palsies, a full description of which has been given in a previous paper by Dr. Peterson and myself(11). In children the lesion is very often cortical, occasionally it is in the vicinity of the ganglia, but in the case with which we are at present concerned the same order of symptoms is produced by a lesion much further caudad. I accept this case as proof of the correctness of the views previously expressed, that these peculiar movements may be due to the removal of inhibition, but that there must be some irradiation of nerve force from one half of the central nervous system to the other, and that this irradiation takes place at any diseased level as low down as the pons and medulla, and possibly even in the spinal cord. Associated movements are explained readily enough on this hypothesis, but why these extreme and violent ataxic movements should occur by transmission of motor impulses through such an imperfect motor tract as we had before us is not so easy to see.

It would seem as though the motor impulses in this case had been transmitted from the healthy side—a sort of overflow of volitional energy from the sound side which is not restrained by the ordinary inhibitory force; the removal of this inhibitory force being due to the lesion in question. From all of which we make the very natural deduction that the two halves of the central nervous system in health coöperate by antagonizing each other's forces, each half in health placing a check upon the superabundant energy of the other.

The preceding communication will serve to illustrate the following points:

1. The slow onset of oculomotor symptoms associated with ataxia and vomiting point to a neoplasm in the vicinity of the corpora quadrigemina.
2. The diagnosis of polio-encephalitis superior (Wernicke) should not be made unless tumor of the quadrigeminal region can be positively excluded.
3. Paralyses of one or more muscles, and not of all muscles supplied by the oculomotor nerve, do not necessarily imply a nuclear lesion. This is particularly true of syphilitic cases, in which an affection of the nerve rootlets may give rise to symptoms exactly like those of nuclear disease.
4. Post-hemiplegic ataxic movements may result from lesion of the crus, and probably from lesion in any part of the motor tract.

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THE TREATMENT OF PENETRATING GUNSHOT WOUNDS OF THE ABDOMEN,

WITH AN ANALYSIS OF ONE HUNDRED AND SIXTY-FIVE CASES TREATED BY LAPAROTOMY.

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IN the *Revue de Chirurgie* of February, 1890, in an elaborate article fifty-three pages in length, two well-known French surgeons, M. Reclus and M. Nogués, make a vigorous attack upon what they are pleased to call the "American" method of treating gunshot wounds of the abdomen. In a long argument, supported by eighty-eight tabulated cases treated conservatively, the old "Laissez-Faire" doctrine is again preached with an enthusiasm which will be sought for in vain in the writings of its earlier advocates; for while these (the earlier advocates) clung to the principle of non-interference, most of them did it as the drowning man clings to the straw—not because he believes it has power to save, but because it is the only thing he can lay hold of. But here we have the principle set forth in an entirely new aspect, and if the bold claims which are advanced in support of it are true, then, indeed, are the laurels which American surgeons have won in this department of their art destined to be short-lived.

The penetrating shot-wound of the abdomen, so dreaded by the surgeons of the past—and justly, too, it would seem, when the highest authorities place the mortality between 80 and 90 per cent.—is now, for the first time, shown to be a comparatively insignificant injury, with a mortality of only 25 per cent.

We naturally expect these brilliant and extraordinary results to be accredited to some newly-discovered method of treatment, but finding the old method of non-interference carried out in every case, we are forced to look for some way of explaining the lack of harmony in the results.

In the *Med. and Surg. Hist. of the War of the Rebellion*, Part II., vol. ii. p. 202 (Otis), we find 3249 cases of penetrating shot-wounds of the abdomen treated expectantly; of these, 88 per cent. died. In the Franco-Prussian War, 1870, 1600 cases of penetrating wounds of the abdomen were reported, with a mortality of 69.47 per cent. (*Centralblatt für Chirurgie*, Dec. 1889).

Still later are the statistics of the Tonkin War—72 cases, with a mortality of 75 per cent. (*Archiv de Méd. et Pharmacie*, 1889).

If to the foregoing we add the New York statistics reported by Dr. Lewis A. Stimson (*N. Y. Med. Journ.*, Oct. 22 and Nov. 2, 1889), we have a total of 4958 cases of penetrating wounds of the abdomen treated according to the method of abstention and showing a *mortality* of 81 per cent.

In spite of these figures, believed by many of the best authorities in abdominal surgery to be too low rather than too high an estimate of the mortality of penetrating wounds of the abdomen—at all events, high enough, it would seem, to convince anyone of the inadequacy of the method of non-interference—its new defenders and champions have given us a table containing 88 cases of shot-wounds of the abdomen, with signs sufficiently pathognomonic in their opinion to warrant their being considered as penetrating, with a mortality of only 25 per cent.

This brilliant record they point to as proof of the superior results of abstention.

In my former paper (published Oct. 18, 1888, *Boston Med. and Surg. Journ.*) in reference to this very point, viz., the large number of cases of recovery without operation, cited by M. Reclus in a previous article, I said: "More light must be thrown upon some very important omissions of M. Reclus before he can have good ground for expecting American surgeons to accept his views. Suppose we accept his 50 cases of recovery without operative interference as authentic, what do these prove? Absolutely nothing, until we are told how large a number of cases that did not recover were found before getting the 50 cases that did recover."

In his recent tables containing 88 cases with only 22 deaths, the author evidently considers this point satisfactorily disposed of, and would have us believe that out of 88 cases of penetrating shot-wounds of the abdomen, 75.7 per cent. recovered under conservative treatment.

Without in any way casting the slightest suspicion upon the trustworthiness of the statistics or the conscientiousness exercised in the selection of the cases, I think it can still be claimed that the tables prove *absolutely nothing* as regards the comparative merit of the two methods of treatment. The cases referred to are either cases which have been collected from published reports in the various medical periodicals or cases which have come under the immediate observation of the writers themselves. Now, as a matter of fact, a very small proportion of the fatal cases would naturally find their way into medical journals, while there would be every reason for bringing to notice a case of recovery from an injury that had come to be regarded, in the light of the best surgical opinion, as almost universally fatal.

In this way the large number of recoveries in the table can be easily explained; far more easily than by supposing that the unanimous opinion of the most renowned surgeons for generations as to the high mortality of this class of injuries has been totally without foundation.

It might, however, be said on the other side that the same objection would apply to the statistics of cases treated by laparotomy, but a moment's thought will convince one that this is not so.

While there are a few scattered cases before 1883 and 1884, not until then did the brilliant successes of Kocher, Bull and Hamilton bring the operation prominently before the surgical world. It soon became a leading subject of debate in nearly every surgical society of this country, and a glance at the reports of European societies will show that the interest in it was not confined to America alone. Every new case in which the operation had been performed was eagerly sought for, and whether successful or otherwise its result, with rare exceptions, was soon made public.

Again, it has been objected that the opinion as to the high mortality of this class of injuries is based upon military statistics, and that in consequence of the larger size of the bullets in these cases the mortality would necessarily be much higher than in cases occurring in civil life. A glance at my tables will show that the severity of the lesion and the mortality bear no direct ratio to the calibre of the weapon, and that even the smallest bullet has caused extensive visceral injuries. Dr. Stimson, in his very admirable monograph already referred to, says in regard to this point: "The size of the opening, while corresponding in a measure to that of the bullet, is yet so seriously affected by other circumstances that no favorable prognostic influences can be safely drawn from the small size of the ball. Thus, in Kocher's case, a 0.22 calibre bullet made an opening in the stomach 1½ centimetres in diameter, and a small ball entering obliquely[1] or cutting along the convexity of a loop of intestine has made an opening an inch or more in length."

In their efforts to detract from the success of the operative method of treatment, M. Reclus and M. Nogués object to the tables of the "interventionists," and accuse them of placing to their credit cases of simple enterorrhaphy practised upon a single coil of wounded intestine protruding from the wound—a simple operation, not dangerous, and in no respect resembling a complete laparotomy, with careful examination of the entire intestinal tract; and they further say that these cases cannot be counted among those "saved by laparotomy," nor likewise can those in which there was no visceral injury and the intestines were not perforated, and with this assumption they at once proceed to exclude in a wholesale manner the cases of Sevastopoulo, Skelly, Smartt, Murphy, Barker, Brown, Cabot, Jalaguier, all of which recovered under operation, thus reducing the number of cases in Class I. (operation performed within first twelve hours of the injury) from 55 to 47, and increasing the mortality from 63 per cent. to 76 per cent. The cases in Class II. (operation after twelve hours) are dealt with in the same way, and the cases of Bull, Andrew, Frick, Newald, Gaston and Hillmantel (4 recoveries and 2 deaths) are ruled out, raising the mortality to 90 per cent.

Before dealing with the question as to the propriety of excluding the above-mentioned cases, there are a number of cases in M. Reclus's tables (103 cases treated by laparotomy, *Revue de Chirurgie*, May, 1890), the removal of which admits of no question. First, the two cases accredited to Hillmantel (both fatal) are duplicates, appearing a second time under the name of Fenger, who performed the operations, Hillmantel simply assisting and reporting the cases, as may be seen by referring to the original reference (*Journ. Amer. Med. Assoc.*, July 21, 1888).

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[1] The recent experiments of Schachner bear out the same conclusion.

Again, the cases of Larry, 1799, Judson, Bently and Gill (*War of the Rebellion*, see Otis's *Hist.*) were all cases of "simple enterorrhaphy," the wounded gut protruding, and in none of them was a true laparotomy performed. It is singular that these cases, the very ones which Reclus claims should be excluded from the tables of the "interventionists," should find a place only in his own tables.

As late as 1877, "Bauden's enlargement of the parietal wound remained unique," Stimson (*loc. cit.*). Thus 6 cases, 5 deaths and 1 recovery, should undoubtedly be excluded, thus reducing the total mortality of M. Reclus's tables to 64 per cent.

Now a word in regard to the 12 recoveries which M. Reclus says should not be counted among those saved by laparotomy.

The cases of Cabot and Jalaguier were both perforating wounds of the stomach.

The cases of Vaslin and Sevastopoulo, multiple wounds of the small intestine, and in both resection of a portion (2 to 4 centimetres) of the small intestine was performed.

The cases of Smartt, Murphy, and Barker had extensive wounds of liver and blood in abdominal cavity.

In the case of Bull, operation was done twelve and a half hours after injury. There was profound shock, surface of body cold, temperature 94°, and evidence of internal hæmorrhage. Operation was done to control hæmorrhage, if possible, but patient died one-half hour after ether was started. Would abstention have given any better chance of recovery?

The cases of Brown, Andrews, and Skelly showed a considerable quantity of blood in the abdominal cavity. The abdomen was washed out and the patients recovered.

The cases of Gaston and Frick are the very cases in which Reclus himself advises laparotomy, viz., where well-marked signs of peritonitis have developed. The case of Gaston was operated upon at the end of the fourth day (surgeon not called before). The intestines were found greatly distended and there was a large quantity of decomposed blood and pus in the abdominal cavity. The patient died two hours after the operation; the autopsy showed *no wound* of the intestinal tract, and only an abrasion of the colon.

In the case of Frick the patient was not found until twenty-five hours after injury; was brought to camp hospital two days later, and signs of peritonitis having developed, operation was performed on the sixth day. A large lacerated wound of the liver was found and a deep abscess had formed along the track of the bullet. A six-inch abdominal incision and free drainage; patient made a good recovery.

M. Reclus, in all his writings on this subject, argues upon the assumption that a penetrating wound of the abdomen is serious and likely to be followed by fatal consequences only when perforation of the intestines exists, and rarely then unless fæcal extravasation has taken place. In other words, that the chief and almost only cause of death (aside from hæmorrhage) is peritonitis. That this is a false assumption was very ably and conclusively proven by Dr. J. Marion Sims in his well-known paper (11) published in the *Brit. Med. Journal*, 1882. He says: "When I went to Sédan, in 1870, as surgeon-in-chief to the Anglo-American Ambulance Corps, I went in the hope that I might do something to elucidate the subject of the treatment of gunshot wounds of the abdomen. I learned this great truth—that all the cases died of septicæmia. The post-mortem examination showed large quantities of bloody serum in the abdominal cavity. In every case there was this evidence of blood-poisoning, and there was not the slightest evidence of peritonitis. There was not a single exception to this rule. Bloody serum is an ordinary result of any gunshot wound of the fleshy parts of the body, and it is not unnatural that it should be found in wounds of the peritoneum. It is possible that an escape of flatus or of contents of the intestine may give intensity to the poisonous quality of the bloody serum in the abdomen."

That perforation of the intestine is by no means necessary to render the wound fatal, is not only shown by the case of Gaston which I have already cited, but is proved in a very striking manner by the four cases of Dr. Hunter McGuire (14) reported at the meeting of the American Medical Association, 1881. These cases were all shot-wounds of the abdomen (2 military, 2 civil), but the ball passed transversely through the abdominal wall without penetrating the parietal peritoneum, simply bruising it. All the cases died, and a considerable amount of bloody serum was found in the abdominal cavity in every case; in reference to these cases Dr. Sims says: "Death resulted practically as it would have done had the peritoneal cavity been penetrated and the intestine perforated."

Enough has been said, I trust, to show that wounds of the abdomen to be fatal do not require perforation of the intestine, and enough to justify the right to place the 12 recoveries above referred to to the credit of operative interference. Taking for granted the proposition which I shall attempt to establish later on, that operative interference in penetrating shot-wounds of the abdomen produces results superior to those obtained by abstention, one very important point still remains to be decided, viz., Shall the principle of interference be subject to more or less narrow restrictions, or shall it be regarded as a principle of universal application? Upon this point the advocates of laparotomy are divided.

Dr. Stimson, in the paper already referred to, says: "Between the two parties—those who would operate in every case, and those who would operate in none—stands a third, those who would operate only when symptoms indicative of dangerous processes have appeared; but I believe this plan the most dangerous of all, and if it were generally followed would lead to the entire abandonment of the operation. We know that an individual in fairly good health can have his abdomen explored without very great risk, and one who has received an abdominal wound not necessarily fatal ought at the moment, or shortly after, to be able to bear an exploration equally well. In such cases the risk of operation, when performed under the proper safeguards, is, I believe, less than that which the bullet has probably inflicted, and it is in such cases that I believe the operation is capable of valuable and superior results."

Dr. Stimson then goes on to say that if several hours, or perhaps a day, has elapsed and the patient is doing well, it might be better to abstain from interference; while if the condition has decidedly changed for the worse and signs of peritonitis have developed, the indications for refraining from operation are even stronger, and though the case may be considered hopeless without it, it is all the more hopeless with it.

To take these two classes of cases in order: first, a word in regard to those cases in which, after the lapse of several hours, the patient is apparently "doing well." Dr. Bull's first case is in point—seventeen hours had passed. There was some pain and tenderness, but pulse and temperature were normal, and patient was "doing well." Laparotomy was performed; seven wounds of the small intestine were found and two pints of bloody serum and clots were found in the abdominal cavity. The wounds were closed, the abdomen washed out, and the patient recovered. Can anyone believe that the case could possibly have recovered without operation? The case of Lange is likewise in point. Twenty-four hours after the injury the condition of the patient was as follows: No shock. Pulse 112. No pain. Abdomen tender and some tympanites. Laparotomy disclosed seven perforating wounds of the small intestine. Wounds were closed, and patient recovered without a bad symptom.

In regard to the second class of cases, when the condition of the patient has become much worse and symptoms indicative of dangerous processes have developed: in addition to the case of Frick, already cited—operation on the fifth day, recovery—I will mention that of Priddy, in which the operation was done 108 hours after the wound had been received, and showed a wound of the colon six inches long; a wound of the mesentery and of the jejunum, and in addition a considerable quantity of bloody serum and pus in the abdominal cavity and well-advanced peritonitis. The wounds were closed, the abdomen washed out with warm 1 : 10,000 bichloride of mercury, and the cavity drained. The patient made a good recovery.

These cases are cited, not to lessen in any way the belief in the great advantage of the *early* operation, for that has been conclusively proved by the history of the first class of cases, but to show that those cases which have gone on until *dangerous symptoms* developed before they came into the hands of the surgeon, and are "hopeless without operation," are *not more* hopeless with it.

Sims, in reference to late operation, when signs of peritonitis have already developed, says: "Nature cures peritonitis in the early stages by uniting contiguous inflamed surfaces by the intervention of plastic lymph; but if the inflammatory process has gone further, and the plastic exudation has terminated in pouches of pus in the folds of the intestines, or purulent effusion in the peritoneal cavity, then death follows from the absorption of the fusiform collection. In this stage why should we not open the abdomen before it is too late, liberate the adhesions, and remove the matter which is imprisoned in pouches or free in the cavity?"

This can be done, and will be done, for it is but the imitation of Nature's clumsy efforts in this direction. It is true that these conclusions of Sims are entirely theoretical, arrived at by inductions based upon his experience in the operative treatment of ovarian disease. To show that they were well founded I need only to call attention to the constantly-increasing number of recoveries from general septic peritonitis, treated by laparotomy and drainage. The case of Sands, following perforation of the appendix (*Medical Record*, February, 1888), was considered almost unique, but the number of cases since recorded shows a brilliant outlook for the operation in the future.

Within the past six months there have been two cases of recovery from acute septic peritonitis treated by laparotomy at the New York Hospital, by Dr. W. T. Bull, the one from the perforation of a gangrenous cæcum, and the other consequent upon the rupture of a suppurating Fallopian tube. Dr. Stimson himself has very recently had a similar case in private practice following a perforating appendicitis, in which he operated more than twelve hours after the acute symptoms had developed, and found a considerable amount of seropurulent fluid in the abdominal cavity. The patient made a rapid recovery. The experience of Tait still further confirms us in the opinion that operative interference should be resorted to in the desperate cases we are considering. Writing in 1885, he says (24) that since Wiltshire first did a laparotomy for acute peritonitis in 1868, and the patient recovered, he himself has opened the abdomen forty-four times for peritonitis, and forty-one of the patients recovered; that he began by operating for peritonitis following ovarian disease, but soon became convinced that there was no reason whatever for thus limiting the operation, and since then he has never allowed a patient to die from peritonitis without opening the abdomen, provided the consent of his colleagues and of the friends of the patient could be obtained. That this principle is rapidly gaining ground, not only in England and America, but also on the Continent, is shown by the recent paper of Kreke (21), "On the Surgical

Treatment of Peritonitis," in which he says: "The treatment of peritonitis, following perforation of the appendix is *operative*, and no other means are for a moment to be considered. When the knife is used promptly the most hopeless cases may recover."

And still again, if further proof were needed, by the excellent contribution entitled "The Surgical Treatment of Peritonitis," read at the last Congress of French Surgeons, by Professor Demosthene (22), of Bucharest.

Before concluding my defence of the "American method" of treating gunshot wounds of the abdomen, I will quote a few lines from a well-known French authority on this subject.

Verchère, in a most admirable and exhaustive monograph on "Wounds of the Intestine by Arms of Small Calibre," published in the *Revue des Sciences Médicales*, 1888, page 297, after having gone over the whole literature of the subject, from Hippocrates down, carefully reviewing the thesis of St. Laurens, and analyzing the cases of recovery that form the basis of M. Reclus's argument, says: "From this we conclude, with the *Americans*, that every penetrating wound of the abdomen is a perforating wound, and that every perforating wound of the small intestine is fatal, and, save with very rare exceptions, followed by death."

Referring to the cases of recovery treated by abstention, he adds: "By the same method of reasoning one might prove that falling from a seventh-story window was a comparatively trifling matter, for it would not be impossible to collect a certain number of recoveries from such an accident."

But these so-called recoveries will hardly stand the test of rigid analysis.

Of the 34 recoveries of St. Laurens, Verchère finds that only 7 can be regarded as wounds of the intestine; and, after searching through all the publications that he could find, he was able to collect only 18 recoveries out of a very large number of cases—several thousands.

In the recent experiments of Schachner, of Louisville, upon dogs, we find that in 32 cases treated by laparotomy the mortality was only 45.1 per cent., while of the 5 cases treated without operative interference only 1 recovered, and in this case there is "strong probability that very slight, if any, injury occurred."

Hydrogen-gas Test.—Three years ago, rectal insufflation by hydrogen gas, as a means of ascertaining whether or not the alimentary canal had been wounded, was proposed by Dr. Senn, of Milwaukee. Dr. Senn's brilliant work in the field of abdominal surgery, both clinically and experimentally, was sufficient reason for its early recognition and almost general acceptance. While some of the more enthusiastic surgeons admitted its claim to "infallibility" without question, others were more conservative, and, while not denying its advantages, reserved their opinion until its merits had stood the test of actual experience. A few others openly objected to the test. Dr. Arthur T. Cabot, of Boston,[1] was among the first to formulate these objections. In the course of his remarks he says: "Dr. Senn's other work in abdominal and other branches of surgery has been so full of practical suggestions that a surgeon having a perforating wound of the abdomen, and neglecting to apply a test so highly praised by him, is open to the charge of a disregard of necessary precautions, if he cannot show good reason for his neglect. Further experience may show the objections I shall state to be purely theoretical, but until this is demonstrated I shall prefer to treat wounds of the human abdominal cavity in a less experimental way."

The chief objections to the test are briefly these:

1. The test is not an "infallible" index of the condition of the alimentary canal.
2. The danger of producing infection of the peritoneal cavity.
3. It shows nothing as to the condition of other viscera, wounds of which *frequently* demand operative interference.
4. It prolongs the operation; interferes with respiration; adds to the shock.
5. It increases the liability of the sutured wounds to give way.

These objections are theoretical, perhaps, at first, but it would seem that at the present time a sufficiently large number of cases are on record to make it possible to draw some definite conclusions as to the value of this method.

In an exhaustive paper read at the International Medical Congress at Berlin, August 8, 1890, on the "Diagnosis and Treatment of Penetrating Wounds of the Abdomen,"[2] Dr. Senn discusses the question at considerable length, and to strengthen the argument in favor of the test, he gives in detail a report of six cases that had come under his personal observation as "A Clinical Contribution in Testimony of the Value and Reliability of the Hydrogen-gas Test in the Diagnosis of Penetrating Gunshot Wounds of the Abdomen."

Of these 6 cases, 3 recovered and 3 died. One, in which the test gave a negative result, was not operated upon, and, in spite of the fact that there was moderate hæmaturia for two or three days, the patient recovered.

In one other case that recovered, the gas-test gave a negative result, but, owing to some defect in the bag, thorough insufflation could not be obtained. The stomach and large intestine were distended, but showed no perforation. Owing to the doubt as to the condition of the small intestine, laparotomy was performed. *No wound* of the alimentary canal was found, but some blood and *pieces of clothing* were found in the abdominal cavity. It would seem that in this case recovery was due to the fact that the bag leaked, for, had the apparatus been in perfect order, the test would have shown the intestinal tract intact, and there would have been no indication for interference, the patient's general condition being (as it was) very good.

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[1] Boston Med. and Surg. Journ., 1889, ii. 81.

[2] Journ. of the Amer. Med. Assoc., Aug. 30, 1890, p. 311.

The third case of recovery happens to be the only case on record in which the intestine had been wounded (and hydrogen-gas test used). In this case thorough irrigation was employed and a drainage-tube left in the abdomen. On the fourth day a fæcal fistula appeared at the site of the drainage-tube.

I have been able to collect a series of 14 cases in which the hydrogen-gas test has been resorted to (including Dr. Burrell's case, in which air was used instead of hydrogen gas) as a means in diagnosing shot-wounds of the abdomen. A careful analysis of these cases shows that 11 cases died and 3 recovered.

The 3 recoveries were Dr. Senn's cases, and were referred to at length above. In the 11 fatal cases the cause of death was peritonitis in 10 cases, hæmorrhage and shock in 1. The total mortality in the 14 cases is 78.5 per cent.—surely not a brilliant showing.

Dr. Senn has attempted to answer the principal objections to the test, but are the answers satisfactory?

The infallibility of the test is no longer claimed, even by Dr. Senn himself, and in giving up that point the test has suffered greatly, for, if it is not *infallible*, how is the surgeon to act when it gives a negative result? The unfortunate experience of Dr. Dalton,[1] of St. Louis, in two successive cases, proves the objections to the test not merely theoretical, but painfully practical.

In one case, a careful application of the test failed to show any perforation of the stomach or intestines. Dr. Dalton said that his faith in the test was so great that he was satisfied they were uninjured. The patient died twenty-eight hours after the injury, and the autopsy showed two holes in the stomach (each one-half inch in diameter) and a large, lacerated wound of the left kidney.

In the second case the test gave positive evidence of perforation, but the distention was so great that it interfered seriously with the respiration; added to the shock, made the restoration of the intestines to the abdominal cavity almost impossible, and caused a rupture of some of the sutured wounds, causing fæcal extravasation. The patient died, and, to quote the words of Dr. Dalton, "here was a case in which Senn's method not only did no good, but absolutely did a great deal of harm."

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[1] Weekly Medical Review, 1889, 23, 243.

Another very instructive case is a case of Fenger's.[1] The external wound was a little to the right on a level with the umbilicus. Thorough insufflation with hydrogen gas gave *negative* result, which, in spite of the fact that the abdomen showed a "changing line of dulness," was thought to be a sufficient reason for non-interference. The wound was dressed on the sixth day, and an area of well-marked induration found. Signs of suppurative peritonitis quickly developed. Laparotomy was performed and eight ounces of purulent fluid, having a fæcal odor, were found in the abdominal cavity, along with other evidences of a well-advanced peritonitis. The patient died eight hours after the operation. The autopsy failed to disclose any perforation of the intestine, and Dr. Fenger goes so far as to cite this case as "an illustration of the proficiency of the gas-test in a case where there is no perforation," and he goes on to say, "we may safely say that one unnecessary laparotomy was prevented."

In view of the fact that of the nine cases in which the abdomen has been opened and the viscera found intact, six of the cases operated upon early recovered, while in two of the fatal cases laparotomy was not performed until the fourth and sixth days, and then for an already developed septic peritonitis, is it not possible to arrive at a different conclusion from Dr. Fenger's? The case not only "illustrates the proficiency of the hydrogen gas test," but it illustrates still more forcibly the danger in relying upon it as an index as to the necessity of operative interference. Had the wound been enlarged and cleansed, laparotomy performed, and the blood removed, there is good ground for believing the patient would have recovered. There is another source of danger in the gas-test, and that is the increased liability to septic infection. It is true that Dr. Senn denies this, and he cites the results of a large number of experiments on dogs to prove that fæcal extravasation is exceedingly rare; but the fact that ten of the eleven deaths in which the test had been used at the operation were the result of septic peritonitis, surely does not tend to lessen our fears. Much is made of the fact that hydrogen gas is aseptic. Such may be its character when it enters the rectum, but it is difficult to see how it could remain so after having traversed the intestine, and it might readily introduce into the abdominal cavity a sufficient number of germs to produce infection, without causing any *visible* fæcal extravasation. While the gas-test is to be condemned as a means of *diagnosis*, there remains a field wherein it may prove a useful adjunct to laparotomy, and that is to detect perforations that might otherwise be overlooked. For this purpose hydrogen gas has no advantage over atmospheric air. Even this limited use of the gas-test has its disadvantages, and it is still open to doubt whether the risk of having left an undetected perforation is not *more* than counterbalanced by the dangers arising from distending the intestines and increasing the liability of the wounds already sutured to give way.

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[1] Journ. Amer. Med. Assoc., July 21, 1888.

At present the observations are too few to determine this point. Since the publication of my former paper, October, 1888, containing 74 cases of penetrating shot-wounds of the abdomen treated by laparotomy, I have been able to collect 91 additional cases, making a total of 165 cases. The greatest effort has been made to obtain all the cases that have been operated upon, without regard to result. My tables contain a large number of unpublished cases, obtained from hospital records or from personal notes from the surgeons who performed the operations.

Of the total number, 165, there were 54 recoveries and 111 deaths, giving a mortality of 67.2 per cent. Of this number there were 81 cases of wounds of the *small* intestine, with 25 recoveries, or a mortality of 67.5 per cent.; 24 cases of wounds of stomach, 6 recoveries, mortality 75 per cent.; 36 cases of wounds of colon, 12 recoveries, mortality 66.6 per cent.; 19 cases of wounds of liver, 8 recoveries, mortality 58.7 per cent.; 11 cases of wounds of kidney, 1 recovery, mortality 90.9 per cent.; 50 cases, carefully analyzed, showed a mortality of 66⅔ per cent. for wounds of the small intestine uncomplicated with other visceral injuries, and 70 per cent. when other viscera were wounded.

Wounds of the stomach, liver, and colon all showed the same mortality in *uncomplicated* cases, 66⅔ per cent.

In the 81 cases of wounds of the small intestine there were 439 perforations, or an average of 5.4 for each case.

Laparotomy was performed in 9 cases in which no viscera were wounded; of these 9 cases, 6 made prompt recoveries, and in 2 of the fatal cases the operation was delayed until the fourth and sixth days, and then performed with the patient *in extremis* for septic peritonitis.

There were 25 cases in which the alimentary canal was found intact; of these, 12 recovered and 13 died; mortality 52 per cent. (this includes many of the fatal kidney cases); 16 cases of resection, 3 recovered.

Hydrogen gas-tests were used in 13 cases; of these, 11 died, 2 recovered; mortality 81 per cent. (The test was used in one other case in which operation was not resorted to, and patient recovered.)

Of the total 165 cases, in only 9 instances did the operator fail to find all the perforations.

In 48 cases, where the causes of death were given, 25 were assigned to septic peritonitis, 19 to shock, 4 to hæmorrhage.

In 16 cases, where drainage was used, 6 recovered and 10 died; mortality 62.7, slightly below the average.

CONCLUSIONS.—Given a shot-wound of the abdomen, the indications are:

1. *Exploratory incision* in the region of the wound to ascertain whether or not it is *penetrating*.

2. If penetrating, *median laparotomy* as soon as possible after the injury has been received unless suffering from severe shock.

3. Signs of a peritonitis, just beginning or well developed, while diminishing the chances of success, are by no means a contra-indication for *operative interference*.

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THE ANATOMY AND PHYSIOLOGY OF THE FAUCIAL TONSILS WITH REFERENCE TO THE ABSORPTION OF INFECTIOUS MATERIAL.[1]

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Although very much has been said and written about the diseases of the tonsils, but little attention, comparatively, has been given to their normal structure and to the *rôle* which they play in the animal economy.

The descriptions of their minute structure in most text-books ot anatomy and histology, and even in special treatises on the throat and nose, are exceedingly meagre. This would account in part, at least, for the considerable diversity of opinion which exists concerning their pathological conditions. We have little definite knowledge of their functions. Certain theories have been propounded, but none have been sufficiently conclusive as to have lead to any very general acceptance.

In view of this these studies are presented. They have involved the examination of a large number of tonsils, both human and from some of the lower animals, *i. e.*, dog, cat, rabbit, monkey, and raccoon; and they include the results of a considerable number of original physiological experiments.

The tonsils belong to the lymphatic apparatus; and in order to make the description of them more intelligible, it seems wise to review the structure of the better known lymphatic organs before describing the tonsils in detail.

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[1] Being the Alumni Prize Essay of the College of Physicians and Surgeons, New York, 1890.

The structures of the lymphatic apparatus may be classified, on an anatomical basis, in three groups.[1]

1. The simplest form of these structures are the minute masses, consisting of connective tissue, reticulum, or basement-substance, the meshes of which are filled with small spheroidal cells. These structures, which were first described by Arnold,[2] are found scattered in many of the viscera, *i. e.*, lungs, liver, and kidneys. The reticulum is exceedingly fine and delicate, and is lined by endothelium. The spheroidal cells are about the size of or somewhat larger than leucocytes, and may contain one or more nuclei. The masses are not clearly outlined, but gradually merge into the surrounding tissues.

2. Of more complex structure are certain nodules of lymphoid tissue occurring in the walls of the stomach and intestine, the so-called "solitary and agminated follicles or glands." Inasmuch as they are in no respect either follicles or glands, they are more properly called lymph nodules. The solitary nodules are little pear-shaped masses lying principally in the submucosa, and are composed of a reticular network, whose meshes are more closely arranged about the periphery. The meshes are lined with endothelium, and are filled with lymphoid cells. In the periphery is a rich network of bloodvessels and lymphatics. The bloodvessels send but a few branches into the more central portion of the nodule. They lie beneath the epithelium of the gut, through which lymphoid cells constantly pass. The epithelial covering is oftentimes thinned and excavated by pressure of the nodule upon it. Peyer's patches, or the agminated nodules, are aggregations of a number of these masses.

3. The most complex of the lymphatic structures, so complex, indeed, as fairly to merit the term organs, are the lymph nodes, often incorrectly called lymph glands. These are oval or irregular-shaped bodies, which interrupt the passage of lymph through the lymph vessels. They are surrounded by a fibrous tissue capsule, which furnishes numerous trabeculæ to the interior. In the outer or cortical zone are a large number of lymph nodules furnished with cord-like anastomosing bodies, which ramify the inner or medullary portion, the lymph cords. The nodules and cords are composed of the same sort of tissue as are the lymph nodules of the intestine, except that their surfaces are covered by endothelium. Both are surrounded by a coarser reticular network containing a few lymphoid cells, the lymph sinuses. The bloodvessels, except the few branches supplying the connective tissue, ramify in the

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[1] The spleen seems to belong more properly to the hæmatopoëtic rather than to the lymphatic system.

[2] Virch. Arch., Bd. 80, 82, 83.

lymph cords and lymph nodules, while the lymph circulates in the lymph sinuses.

The tonsil corresponds more nearly in structure with a Peyer's patch.

Gross Anatomy of the Faucial Tonsils.

The tonsils, two in number, are situated on either side of the mouth, between the anterior and posterior pillars of the fauces, and are more or less covered by folds of the mucous membrane. They are of a pinkish color and oval or almond-shaped. Their long axis, when the mouth is widely opened, is nearly vertical. When the mouth is closed they tend to approach one another, the long axis being more nearly horizontal. Externally they are covered by a layer of fibrous tissue derived from surrounding parts, and which serves as a partial investing sheath. They are covered by the superior constrictor muscle, which separates them from the internal carotid arteries. The internal or free surface projects into the cavity of the mouth; it is covered by stratified squamous epithelium, continuous with that of the mouth. In size the tonsils vary considerably at different ages, and in different persons of the same age. According to Sappey[1] their average vertical measurement is from 20 to 25 mm.; antero-posterior, 12 to 15 mm.; transverse, 10 to 12 mm. As a rule, they are relatively larger in childhood, as is the case with the rest of the lymphatic apparatus.

They reach their maximum size in early adult life. They afterward tend to atrophy, and in old age may become almost entirely obliterated, or converted largely into fibrous tissue.

They are composed, in general, of an aggregation of lymph nodules, separated from one another by diffuse lymphoid tissue, and arranged about a series of depressions from the surface, from eight to fifteen in number, the crypts. These crypts are lined by epithelium similar to that on the surface.

Blood-supply.—The following arteries supply the tonsils:

1. Branches from the dorsal artery of the tongue.
2. Branches from the inferior palatine from the facial.
3. Branches from the superior palatine from the internal maxillary.

The veins empty into the internal jugular. The nerves are, principally, from the glosso-pharyngeal; also branches from the pneumogastric, and possibly also from the spinal accessory (Balme).[2]

The lymphatics will be considered in the description of the minute anatomy.

Anomalies.—But few cases of malformation of the tonsils have been reported. They may be entirely absent (Salmuth[1]), or, but partially developed, as in a case reported by Gould,[2] in which there was also faulty development of other organs. There may be an accessory tonsil (Jurasz[3] and Claiborne[4]).

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[1] Anatomie descriptive.

[2] De l'Hypertrophie des Amygdæles, Paris, 1888, p. 14.

The development of the tonsils has been described by Kölliker[5] and Bickel,[6] and more recently exhaustive studies on the embryology of these structures, both human and in animals, have been made by Retterer.[7] According to Retterer, the tonsils develop both from the epiblast and the mesoblast; the lymphoid cells being formed from the epiblast, while the bloodvessels, lymphatics, and connective framework come from the mesoblast.

They first begin to appear in man about the fourth month, and first consist of a collection of small spheroidal cells in the submucosa; at first the collection is diffuse, but gradually becomes more circumscribed. After a time the collection of cells becomes subdivided by numerous connective-tissue septa.

At the fifth month depressions in the mucous membrane begin to appear. These are the crypts, and at first consist of solid plugs of cells dipping down into the submucosa and into the collection of lymphoid cells. Later these become hollow. In the early months the mucous membrane covering the tonsil has a distinct membrana propria, but toward the end of gestation this disappears. At term the tonsils are fully formed.

Histology.

The parts to be described are as follows:

1. The reticulum or stroma.
2. The cells.
3. The bloodvessels, lymphatics, etc.
4. The epithelium.

1. The Reticulum.—The external or attached surface is covered by a layer of fibrous tissue derived from surrounding parts. From this partially investing sheath numerous septa are given off, dividing the tonsil into a series of intercommunicating chambers. The reticulum or framework in which the cells lie closely packed is of two kinds. A, that which is found in the nodules; and B, that which forms the stroma

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[1] Handb. d. path. Anat., Halle.

[2] Brit. Med. Journ., Oct. 16, 1886.

[3] Monatschrift für Ohrenh., 1885, No. 12.

[4] N. Y. Med. Journ., Feb. 8, 1890.

[5] Embryologie, 1882.

[6] Arch. für path. Anat. und Phys., xcvii. p. 340.

[7] Journ. de l'anat. phys , etc., Paris, 1888, pp. 1–80; also Compt. rend. Soc. de Biol., Paris, 1886, pp. 536 and 581; also vol. iii. p. 27.

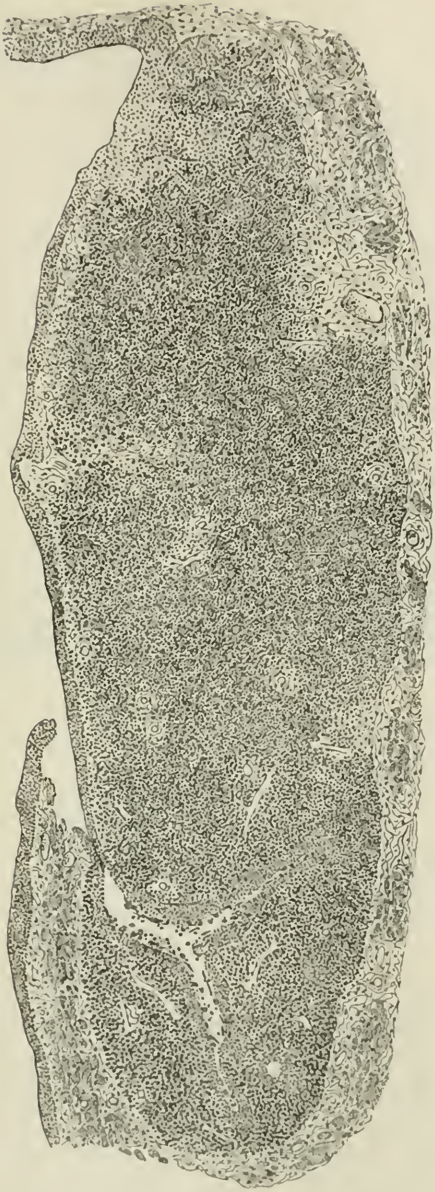
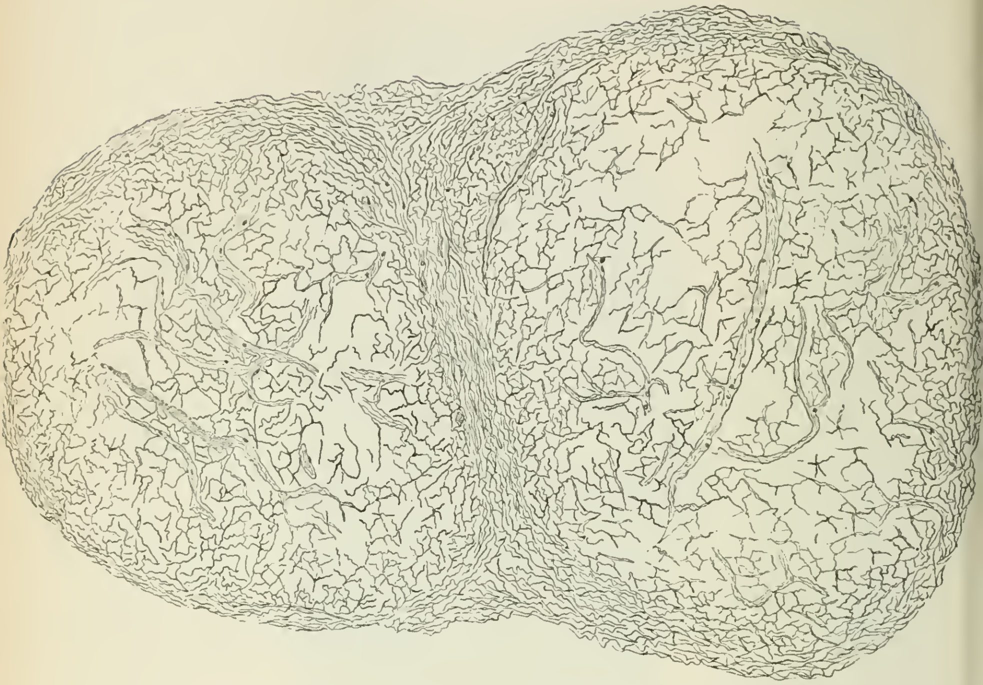


Fig. 1.

Drawing from a section of a normal tonsil from a child.

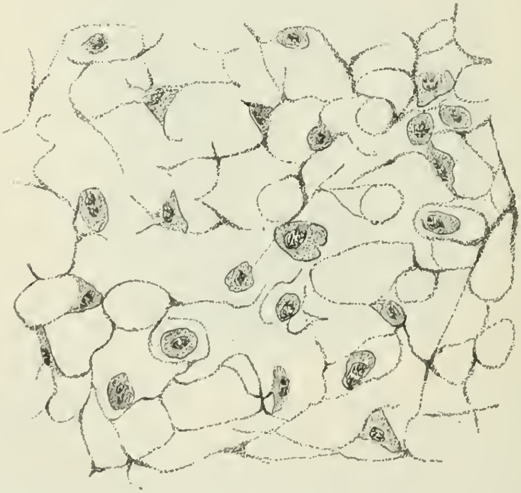
of the tissues between them. (Fig. 2.) The reticular tissue of the nodules is exceedingly fine and delicate. (Fig. 3.) The meshes are lined throughout by endothelium. About the centre the meshes are large and irregular, but toward the periphery they become somewhat

FIG. 2.



A drawing from a section of a normal tonsil from which the cells have been removed, showing the reticulum of two nodules.

FIG. 3.

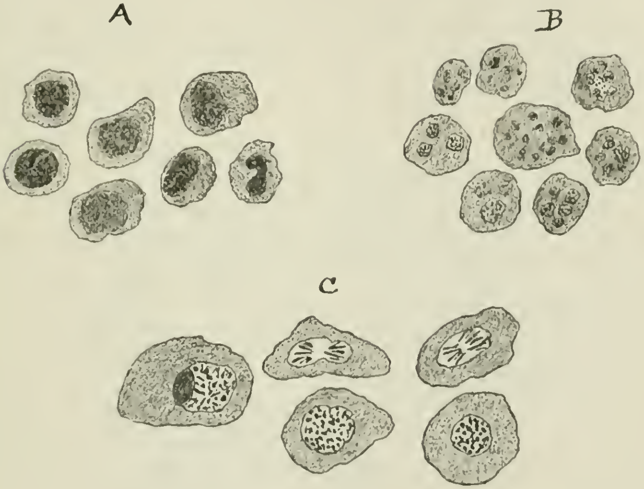


High-power drawing, showing the reticular tissue of a nodule.

coarser and more closely arranged, and finally become merged into the relatively coarser reticulum between the nodules. This form of reticulum contains no connective-tissue cells, and although it is usually described as being composed of connective tissue, it seems more properly to belong to a different variety of tissue. It may be called reticular tissue in contradistinction to the connective-tissue reticulum between the nodules. This last-mentioned form of reticulum differs from that just described, in that it is evidently derived from the fibrous-tissue septa. It is coarser and more closely arranged than the reticular tissue of the nodules, but the meshes are lined by endothelium. About the periphery the varieties merge into one another.

2. The Cells.—Three varieties of lymphoid cells, which almost completely fill the reticular network, may be distinguished. (Fig. 4.)

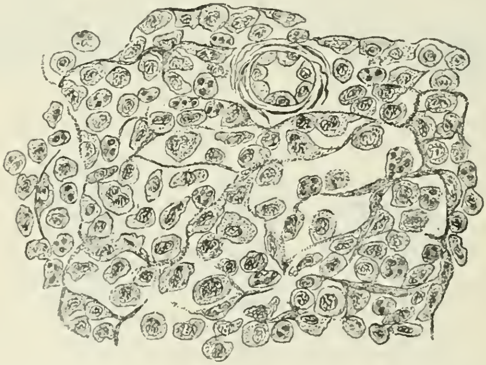
Fig. 4.



The cells which occupy the reticular network.

A. The majority of the cells are of a spheroidal or irregular shape from 5 to 8 μ in diameter, containing a single nucleus from 2 to 4 μ in diameter. The nuclei are either of a homogeneous or finely-granular character, and occasionally contain vacuoles. No distinct limiting cell-membrane can be detected. B. The cells of this group differ from those of the preceding, in that they are multinuclear. The nuclei vary in number from two to four in a single cell. These closely resemble leucocytes, and the relative number of the two varieties differs a good deal in different sections. As a rule, the mononuclear are vastly more abundant than the polynuclear cells. A large number of specimens were carefully examined with reference to cell-division in these cells; but none was observed in which karyokinetic figures could be satisfactorily demonstrated. Karyokinesis, in lymphoid cells, is still a much-disputed point among histologists. The studies of Baumgarten[1] and Ribbert[2] seem to confirm those of the writer. On the contrary, Flemming[3] and his pupils Drews[4] and Paulsen,[5] Peremschko,[6] Lavodowski,[7] Stöhr,[8] and others claim to have observed lymphoid cells in the process of indirect cell-division. C. Large, irregular, flat nucleated cells are found in greater or less numbers in the reticular spaces. In these the protoplasm, which is surrounded by an investing membrane, is granular, the nuclei are relatively large, round, or oval, and sometimes contain nucleoli. The intra-nuclear network is distinct, and often karyokinetic figures can be made out. The origin of these cells was for a long time undetermined. It can no longer be doubted that they are derived from the endothelium lining the reticulum. Under normal conditions, but few such cells within the meshes are usually seen; but in diseased conditions, when increased desquamation of the endothelial lining takes place, they become especially numerous. (Fig. 5.)

Fig. 5.



High-power drawing showing the lymphoid cells and the reticular tissue.

The reticulum forming the framework of the nodules is more closely packed with cells than is that which separates the nodules from one another. Such an arrangement gives to the nodules a denser appearance, but no difference could be detected in the character of the cells in the nodules from those between them. As was shown by serial sections the nodules are arranged concentrically about the crypts.

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[1] Zeitschr. f. klin. Med., Nos. ix. and x.

[2] Ziegler's Beiträge, 1889, p. 185.

[3] Arch. f. Mik. Anat., Bd. 24.

[4] Ibid., Bd. 24, p. 338.

[5] Ibid, Bd. 24, p. 345.

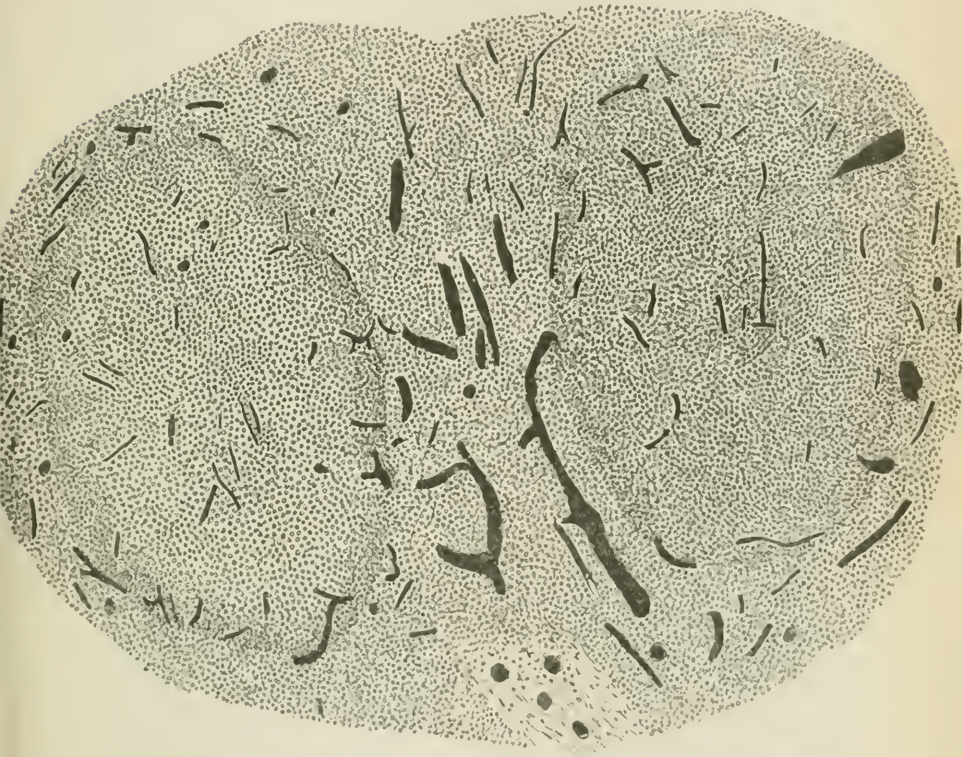
[6] Ibid., Bd. 17.

[7] Virch. Arch, xcvi.

[8] Ibid., xcvii.; also Ueber die Peripheren Lymphdrüsen, Separat-abdruck aus den Sitzungsberichten in Würtzburg, 1883.

3. BLOODVESSELS (Fig. 6).—The larger trunks after entering the tonsil are surrounded by fibrous tissue sheets derived from the basal capsule. The fibrous tissue about the larger vessels would tend to interfere with their contraction and closure when cut; and this anatomical arrangement seems to afford an explanation for the hæmorrhage which sometimes follows cutting operations involving removal of large parts of the tonsil. The larger trunks rapidly divide into smaller branches, which ramify in the tissue between the nodules. As was shown by injected preparations, the nodules themselves are but scantily supplied with bloodvessels; and these, as a rule, are principally confined to the periphery. Beneath the epithelium in the submucosa the blood is collected in small veins, whence it is returned to the larger veins at the base, and is finally emptied into branches of the internal jugular.

FIG. 6.



Drawing from an injected specimen showing the distribution of the bloodvessels.

Lymphatics.—Injections of colored gelatin or solutions of nitrate of silver show that the lymphatic network occupies the whole of the tonsillar mass. The lymphatics constitute a series of closed canals in which the lymphoid cells lie, lined by endothelium, and probably they do not open into the reticular connective tissue, either by stomata or open extremities.

From these lymph channels the lymph is collected by several lymph vessels, provided with valves at the base of the organ. These penetrate the basal capsule and connect with the lymphatics at the base of the tongue, which in turn finally enter the lymph nodes at the angle of the jaw, about at the level of the hyoid bone.

Nerves.—The manner of termination of nerve-filaments in the tonsils could not be determined, since repeated attempts to demonstrate nerve-fibres in them failed in each instance. Aside from nerve-filaments supplying the sheaths of bloodvessels, the presence of nerve-fibres has not yet been demonstrated in the other lymphatic structures.

4. Epithelium (Fig. 7).—The tonsil is covered on its free surface by stratified, squamous epithelium, continuous with that of the mouth. In the fully-developed tonsil there is no membrana propria separating the epithelial cells from the underlying tissue. It differs in appearance and arrangement in different parts. In places it presents a uniform layer of from eight to twelve cells in thickness, and is arranged in three layers; the cells of the outermost being flat and scale-like, those of the middle polygonal and "spined," while those of the inner layer are cuboidal in shape. In other parts, while the arrangement of the cells remains the same, the contour is made irregular by projections upward of the submucosa giving an appearance not unlike the rete Malpighii of the skin.

Such is the usual arrangement of the epithelium of mucous membranes in general. The epithelium of the tonsils, however, and also that covering the solitary and agminated lymph nodules of the intestine, present still other appearances, the result of peculiar alterations in the cells themselves. In such situations, the epithelial cells are diminished in size and are very much altered in shape. The cells now become either cylindrical, irregular, spindle- or star-shaped, and many of them are furnished with long, branching processes, which are apparently continuous with the underlying connective-tissue reticulum. Furthermore, little hollow cavities are found in the epithelial layer, usually near the surface. These cavities contain numbers of lymphoid cells and sometimes are closed on all sides; but sometimes they are provided with minute channels leading to the surface, through which lymphoid cells may be seen to pass.

This alteration, which Zawarykin[1] calls a process of "rarefaction of the epithelium," seems to be the result of pressure from beneath upon the epithelial lining. It causes a great irregularity in the contour of the

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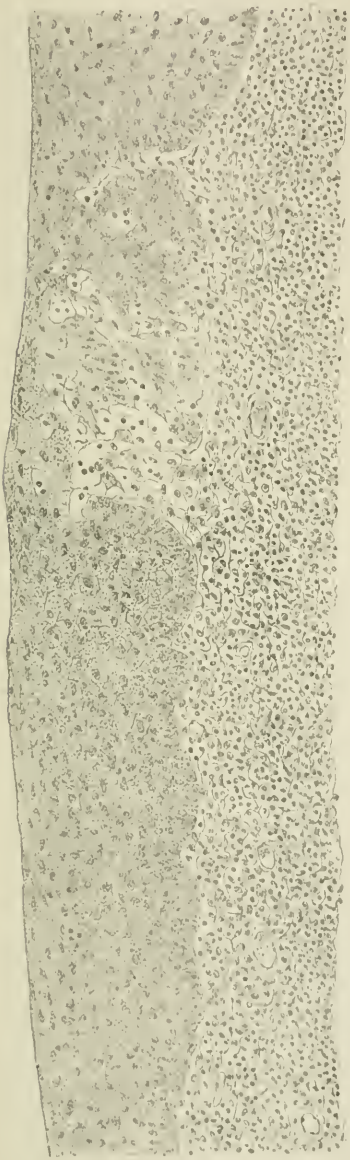
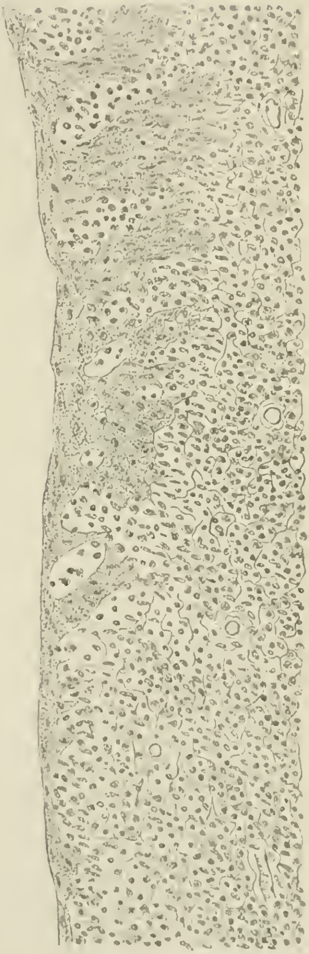
[1] Zawarykin: Anatom. Anzeiger, 1889, No. 15, p. 467.

FIG. 7.



The epithelium covering the tonsil, showing emigration of lymphoid cells and rarefaction.

FIG. 8.



The epithelium covering the tonsil, showing an advanced stage of rarefaction.

epithelial layer, which is also considerably diminished in thickness. In other parts, where these changes have advanced to a still greater degree, the epithelial covering is so thin as to be but one or two cells in thickness. (Fig. 8.)

"Rarefaction of the epithelium" occurs in both healthy and diseased tonsils. Serial sections show it to be of very irregular distribution; and it has apparently no direct relation with the lymph nodules. As yet its physiological significance has not been made quite clear. It greatly facilitates the passage of lymphoid cells from the tonsil to the cavity of the mouth; and it has, I believe, an important bearing upon the absorption of bacteria and their ptomaïnes, and in the production of certain of the acute infectious diseases.

The crypts penetrate the substance of the tonsil, generally at right angles to the surface, but sometimes more obliquely. Their number varies from eight to fifteen in a single tonsil. Usually they are single, but they may divide into two or more branches. They vary in depth and in the size of their lumina, and are lined by stratified squamous epithelium. The contents of the crypts consist of emigrated lymphoid cells, desquamated epithelium, granular matter, cholesterine crystals, bacteria, and occasionally particles of food.

In almost every section, a varying number of small spheroidal cells are found between the epithelial cells. As long ago as 1836 "emigration of white blood-cells" was described by Valentin.[1] Since then the process has been carefully studied by a great many observers. Stöhr[2] has studied this emigration of leucocytes more especially in the tonsils. In all cases, but more especially in tonsils of young persons, a large number of cells similar in structure to those found in the substance of the organ, are continually finding their way through the epithelial covering to the surface or into the lumina of the crypts.

It will be seen, from the above description of the faucial tonsils, that in structure and in the manner of distribution of the bloodvessels and lymphatics, they closely resemble the agminated lymph nodules or Peyer's patches of the small intestine. Except for the crypts, the structure of the tonsils is, indeed, identical with that of a Peyer's patch.

COMPARATIVE ANATOMY.—The tonsils of those animals which were examined were found to be of an essentially similar structure as in the human variety; but in the different species a good deal of difference was observed in their shape and gross appearance.

In monkeys the tonsils differ but little, except in size, from those in man. In dogs, the tonsils are relatively large and spindle-shaped. The long diameter is about four times that of the transverse. The dog's tonsil is folded upon itself, so that it presents a deep fissure, on the surface, which extends from either extremity along the upper and outer aspect of the organ. Into this fissure most of the crypts empty; the few remaining crypts empty on the free surface.

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[1] Repertorium für Anatomie und Physiologie, 1836, p. 283.

[2] Arch. f. Path. Anat. und Phys., xcviii.

The tonsils are but little encroached upon by the pillars of the fauces; and they are very thoroughly exposed to view when the mouth is opened and the tongue is forcibly drawn forward. Consequently, these animals are especially applicable for physiological experiments.

In rabbits, the tonsils are hemispherical in shape and present a single crypt at the centre, about which the lymph nodules are arranged in rows.

In cats the tonsils are pear-shaped, and lie in a pocket of fibrous tissue in which they are freely movable. Only a small part of the organ protrudes, through a small circular opening in the mucous membrane, into the mouth.

TECHNIQUE.—Specimens, for histological study, are better preserved when treated with corrosive sublimate solution, than are those which have been hardened, directly, in alcohol or in Müller's fluid. Any of the many formulæ of sublimate solution may be employed, of which Lang's is, perhaps, the best, consisting of water 1000 c.c., corrosive sublimate 8 grm., hydric acetate 8 c.c. Small bits of perfectly fresh tissue are placed in this solution. After one hour they are washed in water, and hardened successively in 40 per cent., 60 per cent., 80 per cent., and in strong alcohol. By means of double imbedding in both celloidin and paraffine, exceedingly thin sections may be cut, which, provided all the sublimate has been removed, stain readily in any of the more commonly employed staining reagents.

The reticulum is best studied in sections from which most of the cells have been removed. This may be accomplished in several ways. The most satisfactory way is to make frozen sections from specimens which have previously been hardened for from one to two hours in one-third alcohol. The sections are gently shaken in a test-tube of water, care being taken not to continue the shaking too long. The sections are stained on a slide and mounted on glycerin. The outlines of lymphoid cells are best preserved by teasing a bit of the fresh tonsil in a mixture of equal parts of osmic acid, 1 per cent., and normal salt solution.

None of the methods of demonstrating the lymphatics of the tonsil are altogether satisfactory. Ranvier's[1] method consists in injecting a small quantity of blue gelatin into the substance of the organ just beneath the epithelium, and allowing the specimen to cool before it is hardened in alcohol, and cut into sections. Solutions of nitrate of silver, 1 : 500, are also recommended in place of the gelatin. While this method is applicable with the lymph nodes, in the case of the tonsil it has, thus far, always been the misfortune of the writer to puncture some of the smaller bloodvessels with the hypodermic needle, with the result of obtaining a mixed injection. The bloodvessels are easily injected with blue gelatin, artificially through the carotids; or a very good natural injection may be made by suspending the animal before it is killed, by the hind-legs, and hardening the tonsils immediately after they are removed, in strong alcohol.

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[1] D'Histologie. Paris, 1875, p. 671.

PHYSIOLOGY.

As has been stated elsewhere, in this paper, our knowledge of the functions of the tonsils is largely theoretical, as nothing seems to have been done thus far by way of experimentation toward the solution of this problem. Indeed, the physiology of the other lymphatic structures, in spite of all the careful research which has been accorded them, is but little understood.

The unsatisfactory state of our knowledge of the functions of the lymph nodes, for example, is well shown by this statement of Foster.[1] "Obviously here, as in the lymphatic follicles of the intestine, the adenoid tissue or lymphatic substance is the seat of an interaction between the blood and the lymph: here the blood gives something to and takes something from the lymph, or, at least, is in some way changed; here the lymph takes from and gives up to the blood. We may be confident that these changes take place, though our knowledge as to the exact nature of these changes is at present very limited."

Studies in pathology indicate that the lymph nodes act as filters. Thus particles of pigment, bacteria, and cells from neoplasms, which have gained access to the lymph channels, are apt to be caught and held in the lymph nodes.

The bronchial lymph nodes succeed, in most cases, in holding back from the general circulation the particles of inhaled pigment which may have been absorbed by the lungs. Living bacteria, or cells from neoplasms, which still have retained vital properties, when they become lodged in the lymph nodes may incite inflammation, or set up new-growths.

It is almost certain that the lymph nodules of the intestines, especially Peyer's patches, are concerned in the absorption of the products of digestion. A certain amount, though but an insignificant proportion of fats, at least, is absorbed by these bodies. (Schäfer.[2])

The functions of the little masses of lymphoid tissue scattered about in the substance of the thoracic and abdominal viscera are totally unknown.

The studies on the physiology of the tonsils, which I have made, were done, more especially, to determine their relations to some of the acute infectious diseases. Before entering upon a discussion of this subject, it will be necessary to consider some of the theories which have been advanced to explain the functions of these organs.

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[1] Handbook of Physiology, London, 1889.

[2] Journ. Internat. Anat. und Histol., 1885, Bd. ii. p. 16.

Perhaps one of the oldest of these theories is, that the tonsils are secreting organs, furnishing a thick, viscid mucus which lubricates the bolus of food during the second part of the act of deglutition, and which also lubricates the back part of the mouth and pharynx.

Such a theory is abundantly discredited on purely anatomical grounds. The secretion of mucus is furnished by the numerous mucous glands in the adjacent mucous membrane, and not by the tonsils themselves.

The old idea of Perrin, that the tonsils were concerned in the formation of the voice, seems highly improbable. A connection between the tonsils and the organs of the genital apparatus has been suggested. This notion is more a popular one, and is without scientific foundation.

More recently Hill,[1] Spicer,[2] and Hingston Fox,[3] reasoning from analogy, have advanced the idea that the tonsils reabsorb the waste secretions of the mouth and pharynx. According to these authors, especially the digestive ferments of saliva are absorbed by the tonsils in order to prevent waste. Although this theory did, at first, seem plausible, no attempt was made to strengthen it by actual demonstration.

The physiological experiments which I shall describe later show Hill's theory of the functions of the tonsils to be wholly unsupported by facts.

Recent observations have shown that pathogenic bacteria may be present in the mouths of healthy individuals, often in considerable numbers, and an intimate connection between the tonsils and some of the acute infectious diseases has long been supposed to exist. Moreover, it was thought not to be unlikely that infection, in some cases, may take place through the tonsils.

In order, if possible, to throw some light on this most important problem, I have endeavored to ascertain the amount of absorption which, under favorable conditions, may take place through the tonsils. Experiments were done on dogs and rabbits. In most cases the experiments were repeated, and as far as possible controls were made in each case. The experiments consisted in attempting to cause the tonsils to absorb various materials which could be afterward recognized, microscopically, in the tissues; and according to the nature of the materials used and the manner in which they were applied, the experiments may be divided into several groups.

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[1] British Medical Journal, 1888, vol. ii. p. 615.

[2] Lancet, London, 1888, vol. ii. p. 805.

[3] Journal of Anatomy and Physiology, London, 1885–6, vol. xx. p. 559.

Landois states that under ordinary circumstances absorption from the mucous membrane of the mouth is very slight, although sufficient is absorbed to enable the sense of taste to be perceived, and applications of powerful drugs may be followed by systemic effects. I verified this statement by applying a solution of atropine to the mouth of a healthy person and watching its effect on the eyes. Although the solution employed was a strong one, and the application continued thirty minutes, and the drug was distinctly tasted, no dilatation of the pupils followed.

1. The tonsils of several animals, as well as the whole of their buccal cavities, were kept constantly smeared with olive oil, in one set of experiments; in a second set, melted lard was used, and in still a third, lanolin. After from fifteen to thirty minutes the animals were killed, and the tonsils, together with portions of the tongue and pharyngeal wall of each animal, were hardened in osmic acid one per cent. and alcohol, and examined microscopically. The epithelial covering of the tonsils contained a few fine, black granules (fat droplets), generally near the surface. The granules seemed to be between the cells. There was no fat, either in the lymphoid cells, or lying free between them. Sections of the tongue and pharyngeal wall from each animal showed a few fat globules in the superficial portions of the epithelial covering.

2. Finely-powdered carmine, Berlin-blue, and emery powder suspended in water, were applied to the mouths and tonsils of dogs, in a similar manner as were the fats.

Microscopical examination in each case failed to demonstrate the absorption of any of the insoluble material in the sections of the tonsils, tongue, or pharyngeal wall.

3. Solutions of anilin colors in water, and in normal salt solution, salts of iron, and strong solutions of atropine, were kept in contact with the mucous membrane of the mouth and tonsils for from fifteen minutes to one hour. In none of the experiments in which colored solutions were employed did absorption, as was demonstrated by microscopical examination of frozen sections, take place.

The tissues which were subjected to the action of ferrous sulphate were afterward placed in a solution of ferric cyanide of potassium. Sections of these specimens failed to show granules of Berlin-blue in the epithelium or in the deeper structures. The dogs to whose tonsils strong solutions of atropine were applied, showed no dilatation of the pupils after the application had been continued for one hour.

4. Solutions of anilin colors and mixtures of insoluble carmine in water were injected beneath the mucous membrane in the neighborhood of the tonsils in different animals, which were killed one hour afterward. In neither case was the coloring matter taken up by the tonsils.

5. A small quantity of a strong solution of atropine (one-sixth gr.) was injected into a dog's tonsil immediately beneath the mucous mem-

brane, care being taken that none of the fluid escaped into the œsophagus. Within a few minutes the pupils became widely dilated, and soon afterward the dog became very drowsy, and finally was unable to stand.

6. Small quantities of both soluble and insoluble pigment were injected into the substance of dogs' tonsils, and the animals were killed one hour afterward. Upon examination the pigment was found to have collected in the spaces between the nodules, where the point of the needle was carried. It showed but little tendency to diffusion. None of the pigment had been gotten rid of by the surface or was found within the crypts.

SUMMARY OF ABSORPTION EXPERIMENTS.

The experiments just described were done with care, and, as far as possible, all sources of error were eliminated. The results seem to show that in healthy tonsils under ordinary conditions:

1. Soluble or insoluble materials are not absorbed by the mucous membrane of the mouth, or pharynx, or by the tonsils, except to a very slight extent.

2. It is the epithelial covering which prevents absorption taking place by the tonsils. Substances in solution which have found their way beneath the epithelium may be rapidly taken up by the lymphatics and carried into the general circulation.

3. Soluble and insoluble foreign materials in the tissues in the immediate neighborhood of the tonsils are not readily and at once taken up by them.

4. Soluble and insoluble foreign materials in the substance of the tonsils are not thrown off by the surface; but may either remain in the tissues or may be carried off by the lymphatics to other parts of the body.

Baumgarten has suggested that the tonsils might be the point of entrance of tubercle bacilli into the body; that tubercle bacilli which may have been taken into the mouth may be absorbed by the tonsils, where they may result in the formation of miliary tubercles. From thence, Baumgarten supposes, infection may spread through the lymphatics to the bronchial lymph nodes and finally to the lungs. In order to determine the relative frequency of tubercular lesions of the tonsils, and to ascertain the relationship, if any, of these structures to pulmonary phthisis, I have examined, microscopically, a large number of tonsils (nearly 200) for evidences of tubercular lesions. These tonsils were from persons of all ages; and they include the tonsils from eighteen persons who died of pulmonary phthisis. In but one case out of the entire number examined were the tonsils tubercular. In this case they were removed from the body of a man who died of very general tuberculosis.

From the results of these examinations it would seem probable that:

1. Tubercular tonsillitis is a rare affection.

2. The tonsils are rarely, if ever, the site of primary inoculation in pulmonary tuberculosis.

Whatever may be the physiological significance of rarefaction of the epithelium of the tonsils, it, together with a knowledge of the nature of the lesions of diphtheria of the tonsils, unquestionably affords a ready explanation of the way in which these structures become infected in this disease. We have seen that rarefaction of the epithelium is of constant occurrence in the tonsils; that as a result of this process parts of the epithelial covering are very considerably diminished in thickness, not infrequently so decidedly thinned as to be, in certain places, but one or two cells in thickness. Now, as a result of the presence of the contagium of diphtheria, which acts as an irritant to the cells, increased desquamation of the epithelial covering takes place. This proliferation of the cells, as I have actually observed in sections of diphtheritic tonsils, may entirely denude the tonsil of its epithelial covering in places; and the specific virus of the disease is thus brought into immediate contact with the lymphatics of the tonsils, from whence it is carried into the general circulation.

Recapitulation.

1. The tonsils are lymphoid structures closely resembling the Peyer's patches of the small intestine, consisting in general of a congeries of lymph nodules separated from one another by diffuse lymphoid tissue, which are arranged about several hollow depressions of the epithelial covering, the crypts.

2. None of the theories thus far advanced to explain the functions of the tonsils are conclusive.

3. The tonsils produce no physiological secretion.

4. The tonsils are not absorbing organs. They neither absorb fluids or solid particles from the mouth under ordinary conditions, nor do they take up foreign materials from the tissues in their immediate neighborhood.

5. Tubercular tonsillitis is an uncommon affection.

6. There is no evidence to show that pulmonary tuberculosis ever results from absorption of tubercle bacilli from the mouth through the tonsils.

7. Rarefaction of the epithelium of the tonsils affords a ready explanation of the way in which the contagium of diphtheria may gain entrance to the general circulation in this disease.

New York, March, 1890.

WHY THE SPUTA OF TUBERCULOUS PATIENTS SHOULD BE DESTROYED.

An Observation on the Viability of the Bacilli of Tuberculosis.

By Arthur K. Stone, A.M., M.D.,
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During the winter of 1886–87 I became interested in the growth and longevity of the tubercle bacillus, from the statement of a Washington gentleman that he had noticed a decided increase in the number of the tubercle bacilli in sputum which had been kept standing at the ordinary room temperature. (This was simply a verbal statement, and to my knowledge has never been published.)

In order to verify this, a number of jars containing tuberculous sputum were set aside and examined after a period of about three months. The result of the examination was as follows:

No. of case.	Date of first examination.	Remarks.	Date of second examination.	Remarks.
XIV.	Jan. 5, 1887	Few found.	April 15, 1887	Same number.
XVII.	Dec. 15, 1886	Small number.	April 15, 1887	Numerous, very numerous, even in masses.
XVIII.	Nov. 17, 1886	None.	April 15, 1887	None.
XIX.	Nov. 19, 1886	None.	April 15, 1887	Numerous.
XXV.	Jan. 5, 1887	Small number; one cover 3, one had only a very few (7 covers).	April 15, 1887	Small number, but easily found in 8 covers.
XXVIII.	Jan. 7, 1887 Cystitis.	Small number.	April 18, 1887	Very few other bacteria, number about the same as in previous examination.
XXIX.	Jan. 10, 1887	None.	April 15, 1887	None.
XXX.	Jan. 19, 1887	Small number in every field.	April 15, 1887	Small number to numerous; very few other bacteria present.

Examination of this table would simply go to prove that for a period of three months the tubercle bacilli remained in sputa retaining their power of taking stain and so presumably alive and virulent.

Case XVII. shows an increase from "small number" to "very numerous." Reference to notes of this case shows that in the examination of Dec. 15th five covers were examined, of which four were marked as "small number" and one "numerous." April 15th eight covers were looked through; two were marked "small number," two "numerous," four "very numerous"; and at the end of the note, "some masses, and where the preparation is well made the bacilli are present in great quantities." But on the whole, I am inclined to believe that the change was simply due to the increased density of the sputum, caused by evaporation, and to possible carelessness in selection of parts for the first examination.

Case XIX. presents the remarkable statement that no tubercle bacilli were present at the first examination, while they were most easily found in every preparation at the second. The only possibility of error which could have been made in this case arose from the fact that, at the first examination, only four cover-glasses were looked over. The clinical history, as derived from the hospital records, shows that the patient left the hospital with well-marked signs of tuberculosis.

From the winter of 1886–87 until December, 1889, a period of nearly three years, the various specimens of sputa remained upon the laboratory shelves quiet and undisturbed. In the meantime all the aqueous portions had disappeared, and there remained in some cases only a little dry dust about the edges of the glass jars, while in one or two cases there was a hard, dry, brown crust covering the whole bottom of the jar. To prove the presence of the tubercle bacilli, four examinations were made in the following manner:

A drop of distilled water was put upon a cleaned and sterilized cover-glass, and then a bit of the dust or crust removed with a platinum needle rubbed over the cover-glass; usually the crusts would dissolve easily. Any crumbs were removed, the water evaporated, and the specimens stained by Ziehl's method.

No. of case.	Date of first examination.	Remarks.	Date of second examination.	Remarks.
XIV.	Jan. 8, 1887	Few.	Dec. 7, 1889	Very few
XVII.	Dec. 15, 1886	Small number.	Dec. 11, 1889	Small number.
XX.	Feb. 9, 1887	Very numerous.	Dec. 11 1889	Very numerous, long, beaded, or in clumps.
XXIV.	Jan. 5, 1887	Numerous.	Dec. 11, 1889	Numerous.

Practically no other bacteria were present, though usually almost all sputum is especially rich in many forms of bacteria. The bacilli took the stain beautifully, and appeared as bright red as though they had been stained from a fresh specimen.

Having demonstrated the presence of the bacilli in sputa kept for three years, the next thing was to prove their virulence.

December 11, 1889, six rabbits were taken and two were inoculated with a mixture of the sputum dust in sterilized water from each of the following cases: XVII., XX., XXIV. The inoculation was made beneath the skin of the abdomen. At the end of forty days, three of the rabbits were killed, and the result of the autopsies was as follows:

Case XVII.—At the point of inoculation a small tumor two-thirds of an inch in diameter, filled with a white semi-fluid substance, the consistency of very thick cream. Peritoneum, liver, spleen, and lungs normal. Cover-glass preparations were made from the contents of the tumor, and a few tubercle bacilli were found. Sections of the tumor made later showed no tubercle bacilli.

Case XX.—Animal much thinner than when inoculated. A slight thickening was present at the point of inoculation with semi-fluid contents. Peritoneum, spleen, and lungs were normal; liver had several white nodules size of the head of a small pin. Cover-glass preparations from the contents of tumor at point of inoculation showed a few bacilli, though rather questionable in character and not well stained. Section of the liver nodules showed the presence of the coccidia oviformi.

Case XXIV.—Nothing at the point of inoculation. Abdominal cavity more œdematous than usual. Peritoneum, spleen, and lungs were normal. Few white nodules in liver, which showed no tubercle bacilli on section.

The results thus far prove nothing, as the few tubercle bacilli found might have simply been some which were put under the skin at the time of the inoculation in December. The three remaining rabbits were again used and inoculated with the same mixtures as before, but this time the inoculation material was put into the abdominal cavity, the previous experiment having proved that there was no danger of septic infection. The second inoculation took place February 2, 1890, and the rabbits were killed March 28th.

Case XVII.—The seat of the first inoculation showed a small cyst with a few drops of semi-fluid substance, from which cover-glass preparations were made.

On opening the abdominal cavity, a white nodule (1 x 1.5 cm.) was found adherent to the abdominal wall at the point of inoculation. Another large mass lay in, and adherent to, a fold of the larger intestine. Several other smaller nodules were found at various parts of the omentum. Other organs normal. All these nodules had semi-fluid white contents, and of this cover-glass preparations were made with the following results: From the old seat of inoculation, tubercle bacilli lying in clumps of three or four; from mass in side of abdominal wall, four cover-glasses, all showing presence of tubercle bacilli; from the large nodule, several scattered bacilli and one clump of six or eight; from omental nodule, a clump of undoubted bacilli.

Case XX.—Slight cyst at point of old inoculation; cover-glass preparations from the contents were made. No signs of general peritonitis, but adherent to the large intestine and the mesentery were numerous nodules the size of a pea, and having the general appearance of fat. Section, however, showed them to be cystic, and filled with soft, white material from which cover-glass preparations were made. Lungs were normal. The liver contained several small white nodules, which, however, had the appearance of coccidia. Spleen contained one small white nodule. The cover-glass preparations from the cystic growths showed the presence of the tubercle bacilli, few in numbers, but perfectly distinct. Six preparations from the contents of the old inoculation growth all showed the presence of the tubercle bacilli.

CASE XXIV.—All the internal organs were normal. At the point of the first inoculation was a nodule (2 x 2 cm. in diameter). Cover-glass preparations made from the contents showed the presence of a few bacilli. In this case there had always been some doubt whether any of the inoculating fluid had entered the abdominal cavity on account of the leakage of the syringe.

Although the re-inoculation of an animal is a slightly irregular proceeding, yet in this case it is one to which no exception can be taken. The second inoculation simply increased the *dose* of tubercle bacilli, and at the same time put them in a more favorable condition for absorption. The result goes to prove that the bacillus of tuberculosis is not only capable of receiving staining material, when three years old, even though the medium in which they were suspended had been reduced for a period of more than two years to absolute dryness, but that it is also surely alive and virulent. The virulence, to be sure, seems to have been modified by the general drying process, so that the animals were capable of resisting to a much greater degree than usual the poison when introduced.

Another interesting point is in regard to the life-history of the tubercle bacilli. The bacilli, during all the process of drying, had managed to keep their original form and condition, and had not undergone spore-formation. Such, at least, is the fair inference to be drawn from the fact that all other forms of bacteria had disappeared from the sputa dust, while the tubercle bacilli remained and appeared as fresh as though coming from a recent specimen of sputum.

The practical importance of this observation is simply to emphasize the need of the destruction of the sputa of all phthisical patients. The elaborate and painstaking article of Cornet[1] put beyond the shadow of a doubt the fact that a large part of the present widespread tuberculosis was due to the constant exposure of persons who were in a state of low physical condition, or minimum resistance to inoculation with tubercle bacilli to pulverized sputa of tuberculous subjects. Bearing this fact in mind, and adding the results as above obtained, that the dried tuberculous expectorations can remain for a long time—namely, three years—virulent, the practising physician can see the great importance of the destruction of all sputa which may contain the tubercle bacilli.

Experimenters and investigators have all pointed the profession in the same road. There has been no clash, no conflicting statements, and to-day practically everyone agrees to the infectious nature of tuberculosis. But, as Dr. Shakespeare said in closing the discussion on his able paper upon the subject, "What can and should be done to limit the prevalence of tuberculosis in man?"[2]

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[1] Zeitschrift für Hygiene, B. v., 1888.

[2] Transactions of the Association of American Physicians, 1890.

"What use was it for Koch to have made his discovery of the infectious nature of the bacillus tuberculosis, if the practitioners of medicine, those who come in direct contact with the people, who are the natural agents for arousing such a public sentiment and enforcement of laws for the protection of public health, utterly neglect to act upon the ample and exact knowledge which we already possess concerning the etiology and prophylaxis of tuberculosis?"

And it may be added that the value of such careful work as that of Cornet and others, and the value of such a single small observation as the one recorded in this paper is entirely lost, if the practising physicians do not set themselves to work to do their part toward eradicating this great public danger.

This is hardly a paper in which to enter into details of how prophylaxis should be carried out, but at the same time a few hints may not be entirely out of place. All rooms which have been occupied by tuberculous persons should be most thoroughly cleansed before allowing them to be used again. As the best means to accomplish the destruction of the sputa, the physician should tell both the patient and the family of the danger which lies hidden in the expectoration. And then he should insist that all the expectoration shall be destroyed. In the houses of the rich, it is very easy to provide the small paper sputa cups which can be burnt, and thus absolutely destroy the bacilli. Poor people can be made to use pieces of newspaper, which can be thrown into the fire and so destroyed. Fire is by all odds the best means for destruction. Corrosive sublimate solutions and carbolic acid require so long a time before they accomplish their work, that usually the cup containing the sputa is emptied before the bacilli are killed. Everyone will grant that if they are emptied into the sewer, their future harmlessness is probably insured, yet as Volsch has found tubercle bacilli after six months in a foul fluid, and as the above experiments show that the resisting power of the tubercle bacilli is very great, it will be safer to rely on fire for the absolute destruction of tuberculosis material.[1]

[1] The above work was done in the Bacteriological Laboratory of the Harvard Medical School, and the paper read before the Massachusetts Medical Society, Suffolk District, Section for Clinical Medicine, Pathology, and Hygiene.

REVIEWS.

A Manual and Atlas of Medical Ophthalmoscopy. By W. R. Gowers, M.D., F.R.S., Fellow of the Royal College of Physicians, Consulting Physician to the University College Hospital, Physician to the National Hospital for the Paralyzed and Epileptic. Third edition, revised throughout with numerous additions and additional illustrations. Edited with the assistance of Marcus Gunn, M.B., F.R.C.S., Surgeon to the Royal London Ophthalmic Hospital, Moorfields; Ophthalmic Surgeon to the National Hospital for the Paralyzed and Epileptic.

The first edition of Dr. Gowers's *Manual of Ophthalmoscopy* quickly attained a front rank among standard medical works, a position it always has retained, and now more firmly than ever has secured by the appearance of a third revision, rendered especially valuable by the able assistance of Marcus Gunn. In spite of the fact that this edition contains most of the important new observations which have been recorded since 1881, the bulk of the volume has not been increased. This has been accomplished by rewriting many paragraphs in a more condensed style, and by substituting brief epitomes for the extended descriptions of illustrative cases which appeared in earlier editions. Another important change is the insertion through the text, in connection with the subjects to which they refer, of the microscopic figures which formerly were presented on photo-lithographic plates. An excellent addition is the appendix, devoted to a description of how best to sketch the fundus oculi. This is composed of two portions—in one the method of making a pencil-drawing of the ophthalmoscopic picture is described; in the other most acceptable remarks on the production of colored plates are offered. In addition to the thorough revision which almost every page has received, certain entirely new sections have been added. For example, we find one short article on the ophthalmoscopic changes seen in diseases of the nose—a subject which has recently attracted no little attention. This refers only to the remarkable series of cases of disease of the optic nerve associated with a persistent discharge of watery fluid from one nostril, but might with propriety have included the observations of Ziem and others upon the relations between nasal disease and retinal hyperæmia with limitations in the field of vision. No doubt a subsequent edition will require a paragraph upon "Diseases of the Bones," and a description of Jonathan Hutchinson's types of serpiginous choroiditis seen with osteitis deformans. We much wish that Dr. Gowers had written somewhat upon the ocular manifestations of influenza, in so far as these belong to medical ophthalmoscopy, and given us the benefit of his skill in winnowing the chaff from the wheat.

Occasionally, the work of revision seems not to have included certain diseases. Chronic rheumatism, according to Dr. Gowers, has only accidental associations with changes in the fundus oculi. Now, while it is perfectly true that many types of inflammation of the optic nerve which have been ascribed to rheumatism are probably not correctly so accredited, it certainly is none the less true that a number of very well authenticated instances of optic neuritis, especially of the monocular type, appear to have originated directly under the influence of this dyscrasia. Parotitis is dismissed in two lines with the statement that transient dimness of sight and coincident congestion of the optic nerve have been described. The observations of Burnett in this disease, while not connected entirely with medical ophthalmoscopy, might well have been summarized. In whooping-cough we miss a reference to the cases of sudden blindness which have been reported by Alexander, and the forms of choroiditis indirectly produced by the paroxysms of coughing in this disease recorded by Nettleship and others. So many recent observations on the influence of malaria and the malarial cachexia in the production of ophthalmoscopic changes in the vitreous, choroid, and retina have appeared, notably the thesis of Lopez y Veita and the paper by Bull, that some reference to them would seem necessary. Dr. Gowers is of the opinion that slight optic neuritis is not very uncommon in chorea. He points out, however, that the frequent presence of hypermetropia would lessen the significance of this appearance in regard to the chorea were it not that the aspect of the disk in all the cases which he has observed has become normal when the chorea subsided. He makes the rather remarkable statement that in all instances of chorea which he has encountered there has been a recognizable degree of hypermetropia. Now while it is perfectly true that the vast majority of choreic children are hypermetropic, in a collection of something like 250 cases of this disease, twenty per cent. of them were found to have refraction other than hypermetropia, that is either myopia, myopic astigmatism, or mixed astigmatism. Dr. Gowers thinks that actual atheroma of the retinal vessels after death has not been found, and that appearances in the retina suggestive of its existence elsewhere are not apparent. If Raehlmann's report is true, in atheroma of the arteries of the body, especially of the cerebral vessels, a form of strangulation occurs in the retinal arteries indicative of this existence.

In a book in which practically everything is good and most of the sections above criticism, it is difficult to point out definitely those portions which seem to have most nearly attained perfection. We are, perhaps, more struck with the judicial care with which the literature of "medical ophthalmoscopy" has been employed than with anything else, and with the fact that while the student always feels after reading on any one topic that he knows Dr. Gowers's own opinion, he has not come into this knowledge by any dogmatic presentation of the theories or of the facts. One of the most comfortable chapters in the book is that on the relation of optic neuritis to encephalic disease. This begins with the first theory put forward by von Graefe, and traces the various new hypotheses and altered hypotheses which from time to time arose by virtue of new discovery and better methods of investigation, and closes this admirable review with the following conclusions:

"That in cases of cerebral tumor evidence of descending inflammation may be traced in sheath or nerve much more commonly than current statements suggest, while in meningitis the evidence of such descending inflammation is almost invariable. That the resulting papillitis may be and remain slight, or may become intense and present the appearances of mechanical congestion. The causes of this difference we do not know. That such mechanical congestion does not, as a rule, result from the compression of the vessels in or just behind the sclerotic ring, but always, when intense, from compression by inflammatory products in the substance of the papilla. It must not be forgotten that an increase in the size of vessels may be of reflex vasomotor origin, as in all inflamed parts. "That while slow increase of intra-cranial pressure has no effect on the retinal vessels, a sudden increase hinders the escape of blood from the eye for a time, and may intensify a papillitis originating in another way. That distention of the sheath of the nerve alone is probably insufficient to cause papillitis by its mechanical effect, but may, perhaps, intensify the process otherwise set up, especially if the fluid possesses an irritative quality, and if (as Schmidt-Rimpler asserts and Leber denies) it can find its way into the lymphatic spaces of the optic disk."

It is interesting to observe that Dr. Gowers lends the weight of his authority to the use of the term "papillitis," which word, in the opinion of one rather well-known English ophthalmic surgeon, is employed only "by exceptionally bad writers." If Dr. Gowers is an example of the "exceptionally bad writers" who have used this phraseology we wish to cast our fortunes with them.

As year by year improved knowledge and discriminating observation have placed the intelligent use of the ophthalmoscope as an aid in the elucidation of the diagnosis of constitutional diseases upon a higher plane, and the false readings of inexperienced enthusiasts have been subjected to careful revision, in which work the medical world is indebted to no one more than to Dr. Gowers, the subject of ophthalmoscopy has acquired great importance. To anyone who wishes to learn where this science stands, and exactly what relation it bears to medical knowledge as a whole, we recommend this work as by far the best that has appeared in any language. G. E. de S.

CONTRIBUTION A L'ÉTUDE DES PSOROSPERMOSES CUTANÉES ET DE CERTAINES FORMES DE CANCER-MALADIE DE LA PEAU DITE MALADIE DE PAGET. Par le DR. LOUIS WICKHAM, Ancien Interne en Médecine et en Chirurgie des Hôpitaux de Paris, etc. Pp. 184, avec 4 planches hors texte. Paris: G. Masson, 1890.

A CONTRIBUTION TO THE STUDY OF PSOROSPERMOSIS AND PAGET'S DISEASE. By DR. LOUIS WICKHAM.

THIS admirable monograph is a timely contribution to a theme but recently presented for discussion and as yet but little investigated. The disease first described by Paget in 1874 and still associated with his name (eczema of the nipple and areola, and cancer of the breast, malignant papillary dermatitis of Thin) is one whose history and symptoms are to-day well recognized. Somewhat more than one year ago, however, Darier, of Paris, in a remarkable paper, called the attention of the French Biological Society to the fact that he had recognized, in what is known among his colleagues as acne cornée (acne sébacée concrète), and also in a cutaneous affection described by him as "vegetative follicular psorospermia," and lastly in Paget's disease of the nipple, a novel parasite. This he recognized as the ovoid unicellular psorosperm, minutely described by Leuckart, and arranged according to Balbini in five separate families under the class of sporozoæ, one family being limited in its habitat to fishes, the others, in different measure, finding their host in different members of the animal kingdom. These animal cysts, well illustrated in the plates added to the treatise before us, were accurately illustrated in Darier's previous contributions to this subject. Special attention was early attracted to the theme in this country, in consequence of the odd circumstance that Prof. J. C. White, of Boston, was present in Paris when Darier's patient was shown, affected with the "vegetative follicular psorospermosis," and the American dermatologist at once recognized the disease as identical with that described by him earlier in the same year as a form of follicular keratosis. At a subsequent date, but yet soon after his return home, the same gentleman had the singular opportunity of reporting the case of another patient with the same disease, in which a careful structural examination was made with a view particularly to the recognition of the parasites figured by the French author. The result was qualified.

The bodies claimed by the French authors cited, also by Mr. J. Hutchinson, Jr., of London, as the effective agents in the production of the diseases named, are recognized without great difficulty. Their morphological characters are distinct. They are ovoid or circular "corpuscles," very clearly defined, having a lucent and somewhat thickened enveloping membrane, wholly unprovided with fibrillæ of attachment to the peripheral elements. In volume they are two and even three times larger than the cells of the epithelium in which they are found lodged, and between which (never within which) they lie. They have a flattened "nucleus" usually pushed to one side of the enclosed mass of protoplasm, and, after the addition of alcohol, exhibit a decided retraction of this protoplasm with the consequent formation of vacuoles between the latter and the enveloping capsule. In the maturer condition the enclosed mass is found to contain numerous granules, which being released on rupture of the capsular wall, escape and are supposed to reproduce the psorosperms after introduction through an abraded stratum corneum into previously healthy tissue. The cysts are so large as to measure at times one-half or one-third of the entire thickness of the rete mucosum in which they are seen.

Cutaneous psorospermosis is thus thought to be a special pathological condition, solely due to the invasion of the integument by the animal parasites described, and existing not merely in Paget's disease of the nipple and breast, and the similar epitheliomatous lesions which have been recognized in the scrotum, but also in certain forms of acne, molluscum sebaceum ("contagiosum," of Bateman), vegetating follicular psorospermia, in White's follicular keratosis, and also probably in other diseases and more particularly in other forms of cancer.

Upon this advanced position, it is proper to state that the scientific world looks to-day with simply respectful consideration. The conscientious work done by the investigators named is worthy of all praise and of future study. But it is yet to be distinctly settled that an epithelial cell may not under special conditions undergo peculiar metamorphoses with resulting forms which are either identical with or exceedingly difficult to separate from these cyst-like bodies. The failure to reproduce these several diseases by artificial inoculation of the alleged parasites, and the unsatisfactory reports of the results of their culture and of the discovery of a special staining medium have led to a qualified acceptance only of the conclusions here presented.

The genial author of this little monograph may, however, be well congratulated on the fruit of his work. He has not merely given a most creditable report of the whole subject from the special etiological point of view which he and his friends accept, but has furnished us with the best accessible abstract of the literature of Paget's disease of the nipple which has been brought up to date. The plates added, illustrating the gross and microscopical features of the malady, are well reproduced.

His many friends in England and America will be glad to welcome this modest and painstaking contribution to science as the first-fruits of a labor which gives promise of large results. J. N. H.

EPILEPSY: ITS PATHOLOGY AND TREATMENT. An Essay to which was awarded a prize of four thousand francs by the Académie Royale de Médecine de Belgique, December 31, 1889. By HOBART AMORY HARE, M.D. (Univ. Penna.), B.Sc., Clinical Professor of the Diseases of Children and Demonstrator of Therapeutics in the University of Pennsylvania; Physician to St. Agnes Hospital and to the Children's Dispensary of the Children's Hospital; Laureate of the Royal Academy of Medicine in Belgium, of the Medical Society of London; Member of the Association of American Physicians. Pp. 228. Philadelphia and London: F. A. Davis, 1890.

THIS entertaining essay is, we believe, one of nine by this bright and energetic young writer which have received substantial recognition within a short period. Dr. Hare is decidedly to be congratulated on his ability as a prize-taker. That he is an indefatigable worker goes without saying, and he is winning not only monetary prizes, but an enviable name in his special field of work.

The subject is treated systematically in its various aspects—historical, symptomatic, etiological, pathological, and therapeutical. Dr. Hare takes issue with the belief of Gowers that transient post-convulsive paralysis may in certain cases be due to inhibition of the motor centres. Indeed, he is inclined to deal rather severely with this eminent neurologist for maintaining a view which he regards as altogether unnecessary, and entirely without physiological or other foundation. Yet we think that he is wrong; for the transient palsy succeeding a very slight fit, and that following seizures in which a purely sensory discharge replaces motor spasm, are better explained by Gowers's theory, of inhibition, than by that of Todd and Robertson's, of exhaustion. There at least seems nothing unreasonable in the view advanced by Gowers to account for the paresis succeeding a seizure of the latter sort; indeed, it cannot well be explained otherwise. Gowers states (*Diseases of the Nervous System*, Amer. ed., p. 1089) that "just as such a discharge in the sensory centre may . . . set up secondary discharge in the motor centre, so it may, when slight, merely inhibit the centre." As regards foundation for Dr. Gowers's hypothesis, we think the theory fits in sufficiently well with the facts to render it acceptable. Too little is accurately known of the true nature of inhibition to permit one to attempt to dogmatize on the subject. We personally are inclined to the view of Brunton, that inhibition is not dependent upon the existence of special centres. He regards inhibition and stimulation as relative conditions depending both on the length of path along which the nerve-impulse travels, and its rate of transmission. His hypothesis, which is consistent with known facts, is that nervous stimuli, like those of light and sound, consist of vibrations, and that interference of waves, as in the case of light and sound, inhibit action, while coincidence of waves reinforces stimulation. Gowers's idea of the origin of some forms of post-epileptic paralysis is easily explicable by a consideration of Brunton's hypothesis.

We find nothing in the character of the syphilitic headache accompanying luetic epilepsy, described by Dr. Hare, which may not also be present in the cephalalgia attending lead-convulsions, although he is inclined to the belief that the symptoms are more or less peculiar to cerebral syphilis. Tanquerel described a quite identical headache preceding the outbreak of lead-epilepsy, and the reviewer has notes of cases presenting similar phenomena. This point is noted because cases of lead-convulsions occurring in this city, and presumably elsewhere, have more than once been mistaken for both specific and ordinary epilepsy. The reviewer must take exception also to the statement first made by Dowse, and now insisted upon by Hare, that "epileptic attacks beginning after thirty years of age are almost surely syphilitic, particularly if no history of traumatism or heredity is present." Fortunately, lead-convulsions are not of very frequent occurrence, so mistakes are not often apt to arise; yet, perhaps, because of their rarity, and certainly because of their obscurity (often as regards origin and prodromata) it is well to be mindful that they may occur at any age, and in those whose occupation does not expose them to the metal.

Discussing the influence of traumatism on the etiology of epilepsy, Dr. Hare urges that the greatest care be exercised in our decision as to the causative factor, so that we be not misled by a mere history of an injury into a *post hoc ergo propter hoc* opinion. He recognizes that cerebral injury may induce epilepsy, and yet, it seems to us, fails to lay sufficient stress on the well-known fact that even though the primary causative factor of epilepsy be removed, whether it be in a peripheral part, or central consisting of a depressed fragment of bone, the convulsions may still continue through a state of chronic high instability of certain cells having been set up by the irritant which does not disappear with the removal of the latter. This condition of affairs may be present even though no inherited tendency to cerebral disorder exists. Bearing on this, Dr. Hare states (p. 95): "Naturally, if two cases have a history of cerebral injury, and both are epileptic, one is apt to think that the same cause is at work in both instances, but in reality no proof exists that such is the case. In one individual, elevation of a depressed fragment of bone may result in a cure; in the other, even though a depression exists, and is removed, no benefit may be reached, because in the period between the reception of the injury and the first fit the man has contracted syphilis, which has produced epilepsy under the cloak of traumatism, and which is only relieved by mercury and the iodides, or he has a constitutional inherited tendency to epilepsy, aside from any extraneous causes." The convulsions might still have continued in the second case, after the removal of the depressed fragment of bone, and yet the epilepsy have been originated by the traumatism; the same might hold good had the fits had a luetic cause and careful anti-syphilitic treatment had been instituted. As Hughlings-Jackson expressed it, a syphilitic lesion may *cause the cause* of the fits, and this latter cause (probably high instability of cells in the vicinity of the original lesion), not being specific, may continue after the removal of all cerebral evidences of syphilis.

Through an oversight, perhaps, the dose of dilute hydrobromic acid, mentioned in the chapter devoted to the treatment of epilepsy, is considerably larger than that usually prescribed: one-half a fluidounce to one fluidounce, in place of one-half to one drachm. Nickel bromide, too, should scarcely be given in the same dose as potassium bromide. From five to ten grains is the ordinary dose of this salt of nickel, while that of potassium bromide is, of course, much larger.

In concluding these few criticisms we would say that the book is an excellent *résumé*, treated in a painstaking and thorough manner. We cordially recommend it to those interested in the subject.

D. D. S.

HYGIENE AND PUBLIC HEALTH. By LOUIS C. PARKES, M.D., D.P.H. Lond. Univ., Assistant Professor of Hygiene and Public Health at University College, London. With Illustrations. Pp. 485. Philadelphia: P. Blakiston, Son & Co., 1890.

THE second edition of this practical, plainly-written, elementary work on hygiene follows closely upon the first issue. The author must be congratulated upon the success of his efforts to interest the practising profession upon so important and vital a subject. It is remarkable to note how rapidly the question of hygiene is absorbing the attention both of the medical profession and the laity, and although there has not elapsed a sufficient time to allow of very important additions to the mass of sanitary knowledge already presented to his readers, Dr. Parkes is able to supplement the information already given with fresh facts and new tables.

It will be advisable to devote some space to the quotation of the new data and paragraphs, and thus enable the reader to judge for himself, viz.:

"There is also some evidence to show that leaden water-pipes are much more rapidly corroded when the mains are intermittently charged than when kept under constant high pressure."

In speaking of magnetic carbide of iron as a filtering substance, the following paragraph has been added: "A very similar material called polarite has lately come into use. It contains about fifty per cent. of magnetic oxide and carbide of iron combined with other insoluble mineral matters, and is capable of producing equally good results."

Sewage: "Another deodorizing method recently introduced is that known as the 'Amines' process. The sewage is treated with milk of lime and with a small quantity of herring-brine, which contains a certain percentage of the compound ammonia termed methylamine. This substance acts as a deodorant and antiseptic, and is said to sterilize the effluent completely, so that it undergoes no secondary fermentation, whilst the sludge is so far deodorized that it can be dried in pits exposed to the air, or of a drying kiln, without giving rise to noxious effluvia."

Air and Ventilation: "A new explosive termed roburite has been lately introduced into some Lancashire collieries. It is a mixture of nitro-benzines and ammonium nitrate. Several cases of poisoning, however, have occurred amongst the miners, both from handling the cartridges and from breathing the fumes after explosion."

Soils: "Another common cause of damp walls is defective gutters to the roof, or broken or otherwise damaged rain-water pipes."

Mineral waters are referred to with a few words of warning. A case is given of a water described as the purest water in the world. It was found to contain an excess of organic matter and floating particles, which on microscopical examination were discovered to consist of masses of fungi and bacteria, besides being impregnated with sulphuretted hydrogen.

Contagia: "Quite recently mice have been rendered immune against anthrax virus by injection of an albumose isolated from cultures of the anthrax bacilli."

A mere reference is made to chemical vaccination.

A table of weights and measures is also added.

It will be seen from the above quotations that, while no new discoveries of the first importance are to be found in this second edition, nevertheless Dr. Parkes is able to present his readers with some new and interesting facts, and thus keep them *au courant* with the history of this great subject, which can hardly yet be said to have emerged from its infancy.

S. G. D.

THE ESSENTIALS OF MEDICAL CHEMISTRY AND URINALYSIS. By SAM E. WOODY, A.M., M.D., etc. Third edition. Philadelphia: P. Blakiston, Son & Co., 1890.

THE fact that Prof. Woody's little book has reached a third edition in such a short time is sufficient proof of its usefulness for, and demand by, the medical student. The selection of the material and its plan of presentation resulting from the author's large experience as a practitioner and teacher of medical chemistry is well intended to offer to the student that which is really essential for his limited college course, and it is to be hoped, a basis for further instruction in this important branch of medical science.

While we might hint at the superfluous elucidation of strictly-technical processes, and the reappearance of the publishers' much-used cuts from all their other chemical works, such as refining sulphur, making reduced iron, etc., we can but congratulate the author on his additions in organic chemistry and urinalysis, and bespeak for his little work the attention of medical students and practitioners.

L. W.

Mineral Springs and Health Resorts of California, with a Complete Chemical Analysis of every important Mineral Water in the World. Illustrated by Winslow Anderson, M.D., Joint Editor and Publisher of the Pacific Medical Journal, etc. Pp. 384. San Francisco: The Bancroft Company, 1890.

The groundwork of this contribution to our knowledge of balneotherapy and the scientific internal administration of mineral waters was presented to the Medical Society of the State of California, April 20, 1889, and awarded the annual prize of the Society.

The work contains the names of over two hundred California Springs, with about one hundred analyses, and two hundred analyses of all the famous springs in America and abroad. Many of the analyses are by the author and show careful, painstaking work, extending over many years; the result is alphabetically arranged, which greatly aids in the convenience of reference. The surrounding locality of each spring is carefully described; the route of travel and the accommodations that an invalid may expect to find at the end of his journey for health are also considered;—and what can be more essential for the invalid's well-being than pleasant and attractive surroundings?

The vast expanse of territory known as the States of the Pacific Coast is remarkable for the number of its mineral springs, more particularly the hot and warm springs. Of these States, California stands at the head of the list; indeed, it is probable that this State has more known springs than any other State in the Union, east or west; but, on account of the enormous size of the State, and the fact that many localities are as yet almost unsettled, it is impossible in many instances to obtain complete reports.

The springs may be classified as sulphuretted, carbonated, alkaline, saline, chalybeate, and acid. As one would suppose, a large number of the springs are thermal, as over a large area of the State a volcanic rock-formation exists, with which these springs are usually associated. It must be borne in mind that the springs of Southern California are situated in a country whose climate has few equals in the world, and is surpassed by none, so that here the health-seeker may spend day after day, from sunrise to sunset, in the open air and derive all the benefits from such an existence totally independent of any medicinal constituents that the waters may contain. In the selection of localities to which physicians may recommend their patients, sufficient importance has not in the past been attached to the environment, and too much weight has been given to the particular number of grains per gallon in the water to be used.

W. A. E.

PROGRESS

OF

MEDICAL SCIENCE.

THERAPEUTICS.

UNDER THE CHARGE OF

FRANCIS H. WILLIAMS, M.D.,

ASSISTANT PROFESSOR OF THERAPEUTICS IN HARVARD UNIVERSITY.

An Addition to the Therapeutics of Epilepsy.

Almost countless drugs and combinations of drugs have been used in the treatment of epilepsy, with the result that the various bromides, either singly or combined, have so far given the best results in relieving this distressing disease. Dr. Charles S. Potts has sought some drug which would be equally efficacious in lessening the number of epileptic seizures and at the same time not cause the disagreeable symptoms which may follow the persistent use of the bromides. With this end in view various drugs, as antipyrine, antifebrin, and bromide of ammonium were separately tried, but with indifferent results until Dr. H. C. Wood suggested the use of antipyrine and bromide of ammonium in combination. Since then this mixture has been used with excellent results in the treatment of forty-three cases of idiopathic epilepsy. In none did it fail to cause marked amelioration of the symptoms, and in some it gave relief when all the other commonly-used remedies had failed, and in none has there been any indication of bromism, or of the disagreeable symptoms to which antipyrine sometimes gives rise.

For adults the dose, which is given three times a day, contains six grains of antipyrine and twenty grains of bromide of ammonium.—*University Medical Magazine*, No. 1, vol. iii., 1890.

Anæsthetics in Natural Labor.

Dr. Chaigneau has recently made a comparative study of the different anæsthetics which are employed in parturition. Although these agents are very numerous, attention need only be directed toward chloroform, chloral, antipyrine, and cocaine, as they are about the only ones given which it is warrantable to employ under these circumstances. Antipyrine, the author shows, has given only moderately satisfactory results; while it possesses many advantages, yet the inconvenience of requiring large doses, which are apt to prove irritating to the stomach and intestine, detracts from its value. Chloroform, on the contrary, in the author's opinion, possesses so many advantages that it is surprising that it is not more frequently employed. He claims that it has no action on the delivery or on the production of post-partum hæmorrhages, or on any of the conditions of the puerperal state. He maintains that it is indicated in all cases where suffering is excessive, where the contractions of the uterus are spasmodic, or where there is a spasmodic contraction of the cervix, where there is placental retention from uterine contraction, or where there is a rigid perineum. The only contra-indication to the use of chloroform is chloro-anæmia, with a tendency to syncope. He even maintains that acute or chronic pulmonary affections, diseases of the heart, kidneys, or of the nervous system need not interfere with the cautious administration of this anæsthetic.

Cocaine has been but little employed in such conditions. It may, however, serve to render great service in diminishing the pains which attend the passage of the head through the vagino-vulvar canal. The best results can be obtained with a five-per-cent. solution, which may be administered upon cotton tampons, allowed to remain for a few minutes, and then replaced by others. Such a procedure is even stated to accelerate labor, as, the suffering being less, the voluntary assistance rendered by the patient contributes toward hastening the termination; or, a four-per-cent. ointment may be employed, also with apparently equally satisfactory results. It should be noted, however, that sublimate injections should not be employed simultaneously, as through their action the alkaloid is decomposed and its properties are thus lost. Finally, reference is made to subcutaneous injections eight or ten minutes before the expulsion of the head. These injections may be made directly under the labia, and prevent the violent pains which generally attend the passage of the head.—*Therapeutic Gazette*, No. 11, 1890.

EXPERIMENTS UPON THE ACTION OF CHLOROFORM AND ETHER.

The conclusions of PROFESSOR MACWILLIAM, of Aberdeen, in his report to the committee of the British Medical Association, are the result of a long and elaborate investigation in which a novel method of studying the heart and vascular system was used. From his work it seems that during chloroform anæsthesia the blood-pressure is lowered and the heart's action is weakened. Thus chloroform exerts a direct influence on the heart—depressing its energy, diminishing its tone, and dilating its chambers. Such dilatation of the heart occurs to an appreciable extent even when chloroform is administered gently, mixed with abundance of air, less than four per cent., and may occur even before the conjunctival reflex is abolished. The dilatation affects all parts of the heart, more or less, and is not due to the accompanying fall of pressure from action on the vasomotor centres, or to the diminished blood-supply through the coronary arteries. Under chloroform, dilatation often occurs very quickly, before there is any fall of pressure.

There is no distinct change in the rate of the heart's action when dilatation occurs. A sudden and complete cessation of the cardiac rhythm is never caused by the inhalation of chloroform. Cardiac failure occurs by a more or less sudden enfeeblement and dilatation of the organ, not by a sudden, complete cessation of rhythm.

Cardiac failure sometimes occurs in this way a considerable time before the respiration stops, though generally the respiration stops before the heart has become incapacitated, and the failure of artificial respiration to bring about recovery, in some cases of chloroform collapse, is in all probability due mainly to the enfeebled and distended state of the heart, which has become unable to maintain the circulation.

The contrast between the relation to the heart's action of chloroform and ether in anæsthetic doses is very marked. With ether, the induction of anæsthesia with complete abolition of the conjunctival reflex has not been attended by any noteworthy dilatation; indeed, effects of a stimulating character have sometimes been observed.

Changes in the respiration exert a most important influence upon the effects of chloroform administration. An amount of chloroform which can be given with safety during easy breathing may speedily become dangerous during deep, rapid respiration; further free dilution of chloroform with air, the restriction of the percentage of chloroform vapor to four or four and one-half per cent. gives no security against an overdose. A percentage that gives safe anæsthesia during ordinary breathing may lead to fatal collapse if given during exaggerated respiration.

It is suggested that in case of fall in blood-pressure that this condition may be somewhat counteracted, in the upper portions of the body, by pressure upon the abdomen over the aorta.—*British Medical Journal*, No. 1556, 1890.

TREATMENT OF INGROWN NAIL.

DR. PÜRCKHAUER moistens the surface of the diseased nail with a lukewarm forty-per-cent. solution of caustic potash, and then scrapes off the softened upper layers with a sharp-edged piece of glass. After a second application of the potash solution the scraping is continued until the nail is as thin as a sheet of paper. It is then lifted up from the soft parts with forceps, and the diseased parts are excised.—*Therapeutic Gazette*, No. 11, 1890.

PREPARATION OF SACCHARIN.

R.—Saccharin	150 grains.
Bicarbonate of soda	75 "
Distilled water	Oij

One part of this solution is equivalent to two and one-half times as much sugar.—*Nouveaux Remèdes*, No. 19, 1890.

CHLOROFORM AND PHTHISIS.

DR. SAMUEL O. POTTER reports that he has discovered a cure for tuberculosis in the almost continuous inhalation of chloroform. As a result of some experiments he feels convinced that this bacillus may be destroyed, and its victims saved, by the continuous use of chloroform inhalation, systematically carried on, day by day, by means of suitable apparatus, and with the care necessary to prevent injurious results or accidental poisoning. It is not necessary to induce anæsthetic action, but the inhalation can be kept up continuously for several hours daily, and maintained short of general anæsthesia. —*New York Medical Record*, November 1, 1890.

TREATMENT OF DYSENTERY.

DR. H. A. FAIRBAIRN calls attention again to the advantages of irrigation of the large intestine and the thorough flushing of its contents. In the early stages the walls of the intestine are not liable to be weakened by deep ulcerations. The amount of fluid which may be safely used is three or four pints, since the capacity of the large intestine, as a rule, is about six pints. The temperature of the water, which should have been boiled or distilled, should be about 100° or 105° F., except, possibly, in the first or second administration, when quite a low temperature appears of benefit. The patients are confined to bed, are deprived as much as possible of food, except whiskey well diluted. Peptonized milk in very small quantities, not more than a quart in twenty-four hours. If the patient will take no food for forty-eight hours it is a great advantage.

The liquid preparations of beef, with their concentrated salts, are apt to be irritating. Eggs, scraped beef, or, when these are objected to, steak, roast and chop, with bread, make up the dietary.

A cathartic may be administered at the beginning of the case. If there be nausea, calomel in small and frequently-repeated doses is the drug chosen, otherwise sulphate of magnesium. Salol is then ordered, and opium in some form if the pain demands. Naphthalin and corrosive sublimate may also be employed.—*Brooklyn Medical Journal*, No. 10, 1890.

EPSOM SALTS IN THE TREATMENT OF ACUTE DYSENTERY.

Powdered ipecac is the remedy which is most frequently used in the treatment of acute dysentery, and in India large doses of it are considered the best method of attacking the disease.

There are, however, objections to be raised against the administration of large doses of ipecac in this disease. Its influence is depressing, and this action is promoted by the nausea and vomiting, and, further, the vomiting may become uncontrollable.

The disease is one which is accompanied by much nervous depression, which it is important not to increase.

After observing a number of cases in which there were marked depressing effects from ipecacuanha, DR. A. W. LEAHY began treating cases of acute dysentery with a saturated solution of sulphate of magnesium, following a recommendation of Bartholow's, who regards the administration of sulphate of magnesium as the most efficient treatment of this disease, particularly in the acute stage.

Dr. Leahy gives a table of nearly one hundred cases treated at Hyderabad among the poorer class of patients, the vitality of many of whom was at an exceedingly low ebb when they came under treatment. Out of ninety-five, three died; two out of these three cases were stated to have been in a moribund condition at the time of their admission to the hospital. It appears that, on an average, two day's treatment with Epsom salts is required to produce disappearance of dysenteric symptoms. The treatment subsequent to the production of this condition consists of an astringent mixture, with opium. The method of administration is to take a sufficient quantity of sulphate of magnesium to saturate seven fluidounces of water, and to this saturated solution add one ounce of diluted sulphuric acid. The dose of this is a tablespoonful every hour or two in a wineglassful of water until it operates. Sulphate of morphine may be combined with it, or starch enemata with laudanum may be employed.

Dr. Leahy claims that in the earlier stages of dysentery this saturated solution of Epsom salts acts like a charm; fever, if present, disappears; mucus and blood are wanting in the stools, which become copious, feculent, and bilious; the tenesmus ceases; the patient's anxiety diminishes; the skin acts well, and sleep follows the administration of the first few doses. It is especially in acute cases that sulphate of magnesium is so valuable; the more chronic the case becomes, the less apparent are the advantages of this method of treatment. Dr. Leahy has ordinarily given a drachm of this saturated solution with ten drops of dilute sulphuric acid every hour or two until its effects became evidenced in the feculent character of the stools and their freedom from blood and mucus, or until the temperature has fallen, and the pain and tenesmus have ceased. When the stools have become normal in color and appearance, and the patient only passes two or three in the twenty-four hours, an ordinary astringent mixture of acid with laudanum or tincture of Indian hemp, or a pill containing extract of opium, is usually all that is necessary to complete the cure. It is, of course, imperative to diet the patient with great care.

This treatment Dr. Leahy compares with that by ipecacuanha as follows: It has no depressing action on the system, it neither produces nausea nor vomiting; it quiets and soothes the patient.

In twenty-seven cases of acute dysentery among Europeans all were successfully cured.

It is peculiarly in acute dysentery that the saturated solution of sulphate of magnesium will yield such excellent results. The more chronic the case the less likely is the remedy to prove of value.—*Lancet*, No. 3501, 1890.

SULPHONAL IN DIABETES.

DR. V. CASARELLI has used sulphonal in diabetes with the following results:

Sulphonal exerts a favorable influence upon the chief symptoms of diabetes, diminishing the quantity of sugar, also the polyuria and polydipsia.

These results are obtained in a moderate degree by a dose of 15 to 30 grains *pro die.* They are more marked with a dose of 45 grains, which may be given for several days; 30 grains is well borne for a longer time, 45 grains creates no disturbance at first, but if persisted in for a time produces dizziness and excessive somnolence, which disappear upon the reduction of the dose.

The favorable effects of sulphonal are as evident with a mixed diet as with a strict meat diet; in the latter sugar was found in great quantity in the urine after sulphonal had been suspended.

In the same cases antipyrine was tried before sulphonal, but the effect produced by antipyrine was less marked than that by sulphonal.—*Medicinische-Chirurgische Rundschau,* Heft 20, 1890.

MEDICINE.

UNDER THE CHARGE OF

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The Secretion of Hydrochloric Acid in the Stomach during Digestion.

V. Jaksch (*Zeitschr. f. klin. Med.,* B. 17, H. 5, 383) has devoted his attention to the determination of the exact amount of hydrochloric acid present during different periods of digestion. He describes the method of analysis which he employs, and which consists in a modification of that of Sjogvist's. This is a gravimetric method, in which the hydrochloric acid is caused to unite with barium, and the barium then recovered in the form of the sulphate and weighed.

A series of experiments were performed on each of a number of children who presented no disturbances of digestion. A definite amount of nourishment was administered in the morning on an empty stomach, and the contents of the stomach later removed by the method of expression after the lapse of intervals of time varying one-quarter of an hour in the different experiments. The amount of hydrochloric acid present in 10 c. c. of the unfiltered gastric contents was in each instance determined; the author having found that the filtered contents lost considerably in the amount of acid. He details his observations proving this loss.

Series of observations were made by administering respectively boiled ham, boiled milk, and purely hydrocarbonaceous food. All the experiments are reported in full.

The principal results of these studies are the following:

1. Within one-quarter of an hour after the administration of nourishment the stomach has produced an appreciable quantity of hydrochloric acid, and this amount increases until it reaches its maximum from one to three hours after food is taken.
2. The secretion of the acid does not constantly increase, but may, after one and a quarter to two hours, show intermissions.
3. The amount secreted increases most rapidly after the ingestion of flesh; more slowly after milk. This is doubtless due to the property milk has of forming compounds with hydrochloric acid; and this fact also explains the

small amount of free acid found in the stomach of nursing children. The amount of acid increases most slowly after the ingestion of hydrocarbons, though its increase during the first quarter of an hour is most rapid after this form of food.

4. The highest average amount of acid in the gastric excretion was found after a milk diet, and equalled 0.1615 gramme in 100 c.c. gastric contents. After a flesh diet the average amount equalled 0.1563, and after hydrocarbons 0.1102.

5. Digestion appeared to be more rapidly completed after the ingestion of small amounts of flesh; next rapidly after hydrocarbons, and least so after milk.

The author points out how these results may be of value as regards both the physiology and pathology of digestion. From the last point of view he considers that the absence of free acid after one to three hours after flesh or milk has been eaten renders it very probable that there exists some severe disturbance of the gastric function; while no such conclusion can be positively drawn after a diet of carbohydrates. Further, that large amounts of free hydrochloric acid found as long as two to three hours after eating flesh or milk do not indicate a hypersecretion. A milk diet is not to be recommended in the pursuit of studies upon digestion.

In a second part of the author's article he has endeavored to determine the relative sensitiveness of some of the different color-tests for free acid in the gastric secretion. It appears that Congo paper and benzopurpurin have about the same value, but that the Günzburg reaction is by far the most delicate of all the color-tests. All of them are, however, inexact, and not reliable for scientific purposes.

Still a third series of experiments was carried out to determine the amount of hydrochloric acid secreted by sick children under different conditions.

The most important results were:

1. That the quantity of acid found one hour after the ingestion of nitrogenous food depends upon the age and weight of the child.

2. That great variations are witnessed under pathological conditions, but that catarrhal conditions of the stomach, dyspepsia, etc., lead to a diminution in the acid secretion.

The author also tested the value of the administration of weak tea and saccharin as an excitant to gastric secretion, but found that, although hydrochloric acid could usually be detected after three-quarters of an hour, yet it was sometimes entirely absent, and was always much less than after the ingestion of nourishing substances.

THE DIAGNOSIS OF ABSCESS OF THE LIVER.

PEL (*Berlin. klin. Wochenschr.*, 1890, 34, 765) read a paper on this subject before the International Medical Congress, in which he gives the result of his observations on twenty-five cases of solitary liver abscess, of size sufficient to admit of a diagnosis being made during life. Only one of these occurred in a woman.

In many cases an abscess of the liver cannot be detected, either because it produces no symptoms whatever, or because it is too small or too centrally situated to be recognized with any certainty.

The clinical diagnosis of an abscess of the liver depends principally on three factors: 1. Objective symptoms. 2. Subjective symptoms. 3. The etiology.

Of the *objective symptoms*, the enlargement of the liver is a sign never absent in cases capable of being diagnosticated. Yet this enlargement has three characteristic peculiarities which, together, are of almost pathognomonic significance: (*a*) The liver is enlarged chiefly in an upward direction, so that the right lobe pushes the diaphragm upward into the right thoracic cavity. Enlargement of the liver downward and to the left, though usually present also, has but little diagnostic significance. (*b*) The second peculiarity, the more or less, though usually slight, convex form of the upper line of liver-dulness, is a very valuable sign of liver abscess. This convexity may occur at any part of the perimeter of this boundary. (*c*) A third characteristic of the enlargement is that the hepatic-pulmonary percussion boundary which has been displaced upward, and which should in normal conditions be movable through respiration or by lying on the side, is now very little or not at all so. This sign should be looked for very carefully in order to distinguish abscess from a hyperplastic or pseudo-leukæmic liver. This lack of motion is due partly to the formation of adhesions, partly to the fact that the right half of the diaphragm moves less on account of pain, and partly to the resistance which the suspensory ligaments offer to the depression of the organ.

Frequently, with the high position of the diaphragm, there are also present the symptoms of compression or relaxation of the lungs, and care must be taken not to suppose a liver abscess to be a pleural effusion.

Several other objective symptoms may be noticed on inspection. A not inconsiderable distention of the right hypochondrium and the hepatic region, with diminished motion on respiration and widened intercostal spaces, occurring in a man of cachectic appearance and of middle age arouses the suspicion that there exists a collection of pus in the liver. When collateral œdema or a fluctuating tumor is also to be felt in the intercostal spaces or in the epigastrium, no one can fail of a diagnosis.

Further objective symptoms are the suffering, apathetic appearance of the patient, who is evidently very ill; the dull eye, weak pulse, anæmic murmurs, hectic fever. The feet are not infrequently œdematous.

Very considerable dyspnœa increasing on exercise, cough with or without expectoration, and pain and a sense of tension in the side are rarely absent. If in addition to these there is a phthisical habitus and history, and particularly if there is also some slight alteration in one apex, one may be led to make the mistaken diagnosis of tuberculosis. The author has seen the bloody expectoration, occurring after the rupture of a liver abscess into the lungs, mistaken for the hæmoptysis of pulmonary disease.

Icterus was observed in none of the author's cases.

Of the *subjective symptoms*, the pain already referred to may be mentioned as the most constant. It occurs in the hepatic region or in the back, or sometimes in the breast or gastric region, and it often radiates toward the posterior aspect of the right shoulder. It is increased by pressure, and in the latter stages of the disease is very severe.

Finally, the *etiology* is to be considered. The fact that the patient has suffered from tropical dysentery, or even that he has lived in warm climates, may give occasion to the development of an hepatic abscess. Of the cases occurring in temperate regions there may be various etiological factors, such as gall-stone, inflammation in the region of the portal vein, suppuration of echinococcus cysts, metastatic suppuration of the liver, and trauma. But in eight of the author's cases no cause at all could be found.

As regards differential diagnosis, the affection is most frequently confounded with tuberculosis. It must also be distinguished from malaria, pseudo-leukæmic infiltration of the liver, biliary colic with subsequent intermittent fever, syphilis of the liver with or without the formation of gummata, soft neoplasms, deeply situated phlegmonous inflammation of the abdominal walls, encysted pleural effusions, and sub-diaphragmatic collections of pus.

It is especially difficult to determine whether a collection of pus is in the convex portion of the liver or between the liver and the diaphragm, or is an encysted empyema. It is to be noted, in this connection—1, that sub-phrenic abscess almost always gives physical evidences of containing air; 2, that in the case of circumscribed empyema on the anterior surface of the thoracic cavity the heart is almost always dislocated toward the left, and the dulness of the two is continuous.

SURGERY.

UNDER THE CHARGE OF

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SURGICAL TUBERCULOSIS TREATED BY KOCH'S METHOD.

The statement has been frequently made that, in spite of the fact that cases have been treated by Koch's method for many weeks, there are as yet no instances of complete cure. BAUM (*Deut. med. Zeit.*, No. 103, 1890) records two cases which he considers to have been definitely and permanently cured by injection. The first, aged twenty-two years, suffered eighteen years from lupus of the right hand and of the fingers. The disease was extensive and accompanied by much scarring. On the 25th of November 0.008 grm. was injected. The general reaction was very slight. There was, however, marked local reaction. Four days later 0.01 grm. of the remedy was given; this was followed by the characteristic reaction. On the 5th of December, 0.015 grm. was injected. On the 13th of December the whole ulcerating area was entirely healed.

The second patient suffered five years, before treatment, from abscesses caused by caries of the femur. Under surgical treatment these entirely healed. At the time of the Koch treatment there was a large ulcerating area involving the left cheek and the lower eyelid. Two injections were administered, the first containing 0.005 grm. of the remedy; the second, seven days later, 0.008 grm. Local and general reaction were marked. Eight days after the last injection complete healing had taken place.

Rydygier, for the purpose of proving the diagnostic value of the Koch material, used it upon a case of rhinoscleroma without exciting any reaction, although the dose was pushed to 0.14 grm.

In another patient who suffered for seven years from epithelioma of the point of the nose there was a superficial ulceration of the right breast of about six weeks standing. This presented the characteristics of lupus. After the first injection of 0.01 grm. there was not the slightest reaction about the nose, but the lupus-patch was decidedly affected.

In nearly all cases of tuberculosis the spleen was markedly enlarged during the reaction period, and in many instances traces of albumin were observed in the urine.

In one case of lupus, although the lungs were perfectly sound, after the first injection of 0.01 grm. the temperature rose to 105° F., but without other symptoms which could give rise to anxiety. Eight days later the second injection of the same strength was given. Collapse lasting for several hours followed, which yielded slowly to repeated doses of cognac, wine, strong coffee, and hypodermic injections of camphor oil. This case is in striking contrast to the majority treated, since the reaction, after the second dose of the same strength as the first, was far more violent than after the first administration of the remedy.

In one case, aged eight years, with sound lungs, but exhibiting scars and ulcers on the left forearm, together with fistulæ extending to the metacarpal bones, 0.006 grm. of the remedy was followed by violent local reaction and collapse which yielded only to most careful treatment, the pulse beating at the rate of 200 per minute. In both these cases it was observed that during collapse there was marked cyanosis of the lips, nose, and fingers.

Rydygier treated many cases of lupus and of bone and joint tuberculosis, two cases of lymphangitis, and several medical cases, by Koch's injection. A child, suffering from caries of the tarsal bones, was operated upon for removal of the diseased tissues. The three cuneiform bones were excised, and the sharp spoon was used many times. In spite of this, and although treatment by means of iodoform and glycerin and Peru balsam had been carefully employed, a fistula persisted. After the first injection of 0.003 grm. of the Koch remedy the fistula closed. Three more injections were given, the strongest containing 0.007 grm. At the time of the report there was free motion in the foot, no pain on pressure, and the patient seemed entirely cured.

In three lupus-cases, and one case of tuberculous ulcer of the skin, the crusts deposited upon the ulcerating area after injection were carefully examined. In only one instance were many tubercle bacilli found.

Angier (*Mün. med. Woch.*, No. 49, 1890) treated a girl, aged fourteen years, who had been suffering over four months from an ulcer of the nose involving the septum; the latter was almost completely destroyed. Since the injection of 0.005 grm. produced no reaction whatever, it was decided that this lesion was syphilitic. The diagnosis was abundantly confirmed by the use of mercury inunctions.

Another case, which had been operated on two years before for the cure of white swelling of the knee, returned to the clinic. Four injections were not followed by local reaction, from which the reporter concludes that the tuberculous areas were either entirely removed, or, if present, existed in a latent form.

Angier states that the fever lasted longer after the first injection than after those which followed. In one case this fever lasted forty-two hours with three exacerbations. When this patient was injected for the second time the fever lasted twenty hours.

Another instance in which the reaction was more violent after the second injection than after the first, was afforded in the person of a girl aged fourteen years, suffering from lupus of the nose and face. The first injection (0.004 c. c.) was given on October 21st. This was followed by local and general reaction of moderate intensity, with marked swelling of the cervical lymphatic glands. This injection was twice repeated in the same dose without exciting alarming symptoms. On the third repetition (December 1st) the general reaction was intense. The face and hands became cyanotic, and the patient suffered from dyspnœa. Shortly afterward there was a violent chill, the temperature ran up to 105.6° F., and the spleen became much enlarged; somnolence alternating with delirium followed. The local reaction was very slight. The general symptoms did not subside till the third day, when the patient again felt quite well, and the lupus-area and swollen glands were found to have undergone favorable changes.

LANNELONGUE (*Bulletin Méd.; Deut. med. Zeit.*, No. 104, Dec. 17, 1890) reports a case of lupus involving the nose, face, and left hand. The patient was eight years old, and suffered from no other tubercular lesions. Three injections were given, when, on the eighth day of treatment, the patient complained of pain in the knees. On examination there was found distinct diminution in the power to rotate the head, very great swelling of both elbows and both shoulders, especially the left; pain in the left thumbs; pain and tenderness in the head of the femur; limited motion in the ankle-joints, and an abundant effusion into both knee-joints.

This, according to Lannelongue, would point rather to diffusion of tubercular infection than to development of latent tuberculosis, since the symptoms described did not appear for eight days after the first injection.

BULIKOWSKI (*Przeglad lekars.*, 50, 1890; *Deut. med. Zeit.*) after observing the effect of the Koch injection, as practised in Kaposi's clinic, comes to the following conclusions:

1. The injection of Koch's material excites in lupus-areas an inflammation accompanied by the well-known general symptoms of reaction.

2. Reaction follows not only in pure tuberculous diseases, but also in others, as, for instance, lepra arabum, lupus erythematosus, and sarcoma.

3. It cannot yet be positively asserted that the injection of Koch's material is always followed by reaction, even though the disease is strictly tuberculous in nature.

EBSTEIN (*Deutsch. med. Woch.; Deutsch. med. Zeit.*, No. 1, 1891) states that the Koch injections are contra-indicated by the presence of tubercular ulcerations of the bowel, especially where there have been recent hæmorrhages, by the existence of constant pain and localized abdominal tenderness pointing to the presence of circumscribed peritonitis secondary to bowel ulceration, by colliquative diarrhœa especially when associated with hectic; and by the existence of tubercular peritonitis accompanied by fluid exudate. Ebstein reports an exceedingly interesting case of tuberculosis in the urethra. The patient was suffering from involvement of the apices of both lungs and from laryngitis of moderate severity. When examined, on his entrance into the hospital, a tight phimosis was found. After operation upon this there was discovered an induration beginning behind the glans penis and involving the corpus cavernosum. This indurated area was about two inches in length and almost an inch in breadth. The borders were irregular, but sharply circumscribed; there was no tenderness on handling, but behind this indurated area pressure gave pain. The urine contained albumin, red blood-corpuscles, and tubercle bacilli. By pressing upon the urethra behind the infiltration, pus containing tubercle bacilli was forced from the meatus. The inguinal glands were slightly enlarged. There was some tenderness on pressure in the region of the left kidney, The patient did not react till the fifth injection, when the dose of 0.01 c. c. was reached. No local reaction was observed, nor was there detected any distinct amelioration in the local lesion.

In a case of brain tumor, Ebstein practised an injection of 0.001 c. c. to determine whether or not this lesion was tubercular in nature. The patient experienced a decided rise in temperature, and had nine convulsions during the night following the treatment; these were apparently due to the action of the remedy upon the intracranial lesion.

In a patient, aged forty years, suffering from what was apparently syphilitic involvement of the sternum and left knee, injections of two, four, and six milligrammes, respectively, excited no fever, but decidedly increased the local pain. After subsidence of the latter there was a marked improvement in the mobility of the knee-joint. A chronic eczema of the leg became red and inflamed.

CZERNY (*Deutsch. med. Woch.*, 51, 1890) practised a hundred and forty-eight injections upon fifty-five patients in two weeks. There were twenty-two cases of joint disease, ten of whom had previously been operated upon. Glandular enlargements, periarticular fistulæ, peritonitis, lupus, periurethritis, and other forms of surgical tuberculosis were treated.

Czerny grants that the Koch material exerts a specific action upon tuberculous processes. There are however, non-tubercular individuals who react to 0.01 c. c. of the material, and again, certain tuberculous patients do not react. While it is true that, as a general rule, the reaction becomes less violent when the injections are repeated, there are exceptions to this. There may be a violent reaction without fever, or the general reaction may be exceedingly well marked, while the local reaction is wanting. Violent general and local reaction in cases which bacteriological and physical examination has shown are apparently sound, would suggest the possibility of a dissemination of the tubercle bacilli. In the initial forms of tuberculosis, and in lupus, the

Koch material is so satisfactory in its results that it may fairly be considered the most brilliant discovery of therapeutics.

Tuberculosis and Pseudo-tuberculosis.

Roger (*Gazette Hebd. de Méd. et de Chirur.*, 37 An., No. 45) shows that in tuberculosis there is absolutely nothing which may be considered characteristic in the anatomical elements of the lesion, or in the arrangement of these elements. Animal parasites, inert foreign bodies, or the syphilitic lesion, may all be characterized by the central giant-cell with its surrounding zones. The pseudo-tuberculosis from foreign bodies, and that dependent upon verminous parasites, are readily distinguished by the absence of infectious properties. The pseudo-tubercular affections are practically not found in man; in the lower animals, in addition to the causes just named, may be mentioned non-bacterial mycoses (aspergillus), and bacterial zoöglœa and bacilli.

Roger, on the basis of a comparative study, doubts whether the appearance and staining reaction of the tubercle bacillus are sufficiently characteristic to separate it from all other bacteria. The bacillus of fowl-tuberculosis is, on accurate study, found to differ from the human bacillus in regard to its growth on culture media and its virulence when injected into various animals; yet the staining reactions are the same, and the general appearance is almost identical.

In view of the varying progress of tubercular disease in the human being, the rapid course and wide extension in some cases, the long-continued localization and ultimate cure in others, it seems probable that there may be in man several varieties of bacillus reacting in the same way to stains, but possessed of different pathogenic properties.

Microörganisms of Suppuration as Accessories to the Tubercle Bacillus in Lupus.

After careful bacteriological and clinical study, Leloir (*Le Médecine Moderne*, 1re An., No. 49) finds that in many cases the ulcerations and nodosities characterizing a lupus-area and its environment are immediately excited, not by the tubercle bacilli, but by the microörganisms of suppuration. The lupus-lesion is essentially a dry tubercle. Ulceration does not usually occur except as the result of the action of suppuration microbes.

When the Koch bacilli and pyogenic microörganisms combine their action the elementary lupus-lesions become softened and exhibit a tendency to suppuration and ulceration. This fact is of major importance from a therapeutical standpoint, since anti-tubercular treatment will often aggravate symptoms which will promptly yield to anti-suppurative applications.

Hernia through the Foramen of Winslow.

Michel Gangolphe (*Lyon Médicale*, t. lxiv. p. 607, 1890) reports a case of this rare condition. The patient, a man aged fifty-seven years, was seized, twenty-four hours before admission to the hospital, without any appreciable cause, with violent intestinal colic, vomiting, and inability to pass gas or fæces. Four years before this he had had an exactly similar attack, which had easily been relieved by the use of enemata. The obstruction and vomiting continued. There was almost no abdominal distention. The pulse and general condition were good.

Laparotomy was performed four days after the beginning of the attack. The small intestine was explored, and, with gentle traction, there was brought to view a portion which had been subjected to a circular constriction, as shown by the white ring around the bowel and the collapsed portion of the gut beyond. It was supposed that the obstruction had been relieved, and the abdomen was closed. The symptoms continued as before operation, and the patient died three days later. The autopsy showed that almost five feet of the small intestine were contained in the lesser cavity of the peritoneum, having entered through the foramen of Winslow. At the first operation only a portion of the gut had been withdrawn, and the obstruction consequently continued.

THE SURGICAL TREATMENT OF PERITYPHLITIS.

TAFFIER and HALLIM (*Archiv. Gén. de Méd.*, September, 1890, p. 257) present a paper upon this subject. They call attention to the fact that operation for perityphlitis is practised less in France than in other countries. As is the custom here, they apply the term perityphlitis to any inflammation in the neighborhood of the vermiform appendix or the cæcum, regardless of the primary cause of the inflammation. They consider disease of the vermiform appendix the cause of the great majority of inflammations in this region; perforation of the appendix is produced in most cases by a fæcal concretion. They advise operation as soon as the formation of pus is suspected. They call attention to the fact that haste in operating is much less dangerous to the patient than delay. The incision for ligature of the internal iliac artery is the best. The vermiform appendix should always be excised if possible; the abscess cavity well drained and washed out. They mention a case in which the opening in the vermiform appendix—through which a concretion had escaped—was closed with Lembert sutures, and yet three months after the operation the wound reopened and a quantity of mucus was discharged.

The paper is concluded with a long list of cases—by various operators—in which operation had been performed for perityphlitis.

LAPAROTOMY FOR GUNSHOT WOUND.

DR. W. T. SCOTT (*Medical Record*, vol. xxxviii., No. 19, p. 516) reports a successful case of laparotomy for gunshot wound of the abdomen. The bullet was a 0.38 calibre conoidal ball. It entered the abdomen one and three-quarters inches above and to the right of the left anterior superior spinous process of the ilium.

Laparotomy was performed four hours after the receipt of the injury. A small quantity of the intestinal contents was found in the peritoneum. Four perforations of the ileum were discovered within a distance of four inches The ball was not found, and no further injury was detected.

The intestinal wounds were closed with the Czerny-Lembert suture; the peritoneum was freely irrigated and drained with a glass tube. The patient made a good recovery. The author states that the intestines were comparatively empty at the time of operation.

RENAL DISEASE FOLLOWING GONORRHŒA.

DR. J. KENNEDY (*New York Medical Journal*, vol. lii., No. 16, p. 483, 1890) reports a case of external urethrotomy for stricture of the urethra and chronic cystitis. The patient died a few hours after operation with absolute suppression of urine. The post-mortem showed suppurating kidneys three times the normal size.

The author considers that gonorrhœa may induce disease of the kidneys in the following ways: By direct extension of the inflammatory process; by interference with escape of urine, as in stricture; by reflex irritation; by the excessive and injudicious administration of diuretics.

A NEW PLATE FOR INTESTINAL ANASTOMOSIS.

DR. T. B. ROBINSON (*New York Medical Journal*, vol. lii., No. 16, p. 429, 1890) offers a new plate for intestinal anastomosis. The plate is made of raw hide, prepared by shaving the hair from the green hide of an ox. The hide is then cut into strips one inch wide by two and a half inches long, and perforated by a diamond-shaped aperture. The plates are armed with four or six sutures and needles. He claims that these plates are eminently suitable for the operation of intestinal anastomosis. They are accessible and easily prepared. They are absorbable, and can be well adapted to the character of the intestinal tract.

The author advises the use of omental grafts in most operations upon the intestines. He has used this method of anastomosis satisfactorily in over one hundred and sixty experiments upon the lower animals.

THE MANAGEMENT OF DAMAGED BOWEL IN STRANGULATED HERNIA.

BENNETT (*The Lancet*, No. 16, vol. ii., 1890, p. 805) reports three cases of strangulated hernia, in which there was present damaged bowel. In the first case there was a lacerated opening into the intestine, through which fæces had escaped into the hernial sac. The opening was closed by buried sutures in the mucous membranes, and by Lembert sutures; the bowel was returned, and the abdomen closed without drainage. The patient recovered easily.

In the second case there was degeneration of the bowel, and a breach of surface involving the peritoneal and muscular coats. The tissues were so softened that suturing was impossible. The bowel was washed and returned just inside the ring, and a large drainage-tube placed in contact with it. Ten days after the operation fæces escaped through the tube. Four weeks after the operation the fæcal fistula had completely closed.

In the third case the sac was stinking and gangrenous, the contained gut piebald in aspect, lustreless, and, so far as could be judged, obviously gangrenous. The gut was returned just inside the ring, and a large drainage-tube was introduced as near the diseased bowel as possible. Recovery took place without the formation of a fæcal fistula.

The author explains the recovery in the last case in this way: By reason of the thorough antiseptic cleansing of the affected bowel the gangrenous portion was enabled gradually to disintegrate and come away through the large tube without the formation of any gross interruption of continuity in the intestinal wall.

The author advises in the treatment of damaged bowel in strangulated hernia: Free division of the stricture; the return of the intestine just inside the abdomen with as little pressure as possible, after thorough antiseptic cleansing; the careful adjustment of a drainage-tube, having a diameter of not less than half an inch, in such a way that its inner extremity may lie almost in contact with the reduced bowel. He considers resection very rarely necessary; and the formation of a fæcal fistula, as in the second case, very much to be preferred to the formation of an artificial anus at the time of operation.

OTOLOGY.

UNDER THE CHARGE OF

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Post-mortem Examination of the Ear in a Case of Acquired Deaf-dumbness.

Drs. P. C. Larsen and Holger Mygind, of Copenhagen, have given an account of this very interesting case in a recent number of the *Archiv für Ohrenheilkunde* (vol. xxx., September, 1890). The patient, when two and a half years old, was attacked with some form of cerebral disease, for which no physician was called. In the course of eight weeks after recovery it was discovered by his family that he was deaf. Before the attack he undoubtedly heard well. From the notes given it would appear that the child had suffered from cerebro-spinal meningitis. When about twenty-one years old this young man died of phthisis, in the Royal Institution for the Deaf and Dumb, Copenhagen.

Both temporal bones were examined within two hours after death by the above-named observers. The right temporal bone was normal in shape and size. The aqueducts of the vestibule and cochlea were impervious a few millimetres from their external openings. The external auditory canal was normal, and closed at its inner end by a normal membrana tympani. The malleus was slightly retracted and not very movable from without. The tympanic cavity was normal in shape and size. The mucous lining was thin and pale, and not thrown into folds; nor were there any adhesions. The entrance to the mastoid antrum and Eustachian tube was of normal appearance. The mastoid cells were normal. The Eustachian tube was not narrowed. Hammer and anvil were of natural form and size, with freely movable joint between them. There was also free motion in the anvil-stapes joint. The stapes looked normal, excepting an unusual divergence between the crura. Closer examination of the joint between the stapes and the oval window revealed that the base of the stapes was absent and the crura ended free. The oval window was somewhat contracted so as to appear like a slit 2¼ mm. long, wider at the anterior end. At this anterior part of the window the free anterior crus of the stapes was fastened. The posterior crus of the stapes rested in the oval pelvis about ½ mm. behind the posterior edge of the oval window, and was bound fast at this point by fibrous adhesion. The fossula of the round window was present, but entirely filled with an osseous mass. The tensor tympani and stapedius muscles were present, apparently normal.

In the *labyrinth* there was no trace of semicircular canals, because that part of the petrous bone which corresponds to their seat was changed into a compact bony mass. The cavity of the vestibule was considerably narrowed in extent and form, and was without a trace of normal membranous contents.

Of the *cochlea*, only the first whorl was discernible, yet this was filled with a sclerotic bony mass.

The internal auditory canal was of normal appearance and width. However, there were no traces of maculæ cribrosæ superiores, mediæ, nor inferiores.

The left temporal bone showed the same changes as the right.

The *auditory nerve* on both sides was present, but considerably thinned.

The *brain* was normal excepting that the lowest frontal convolution on the left side, as also the neighboring convolutions of the island of Reil, was markedly lower and narrower than those on the right side. The furrows between them were wider. The striæ acusticæ were plainly discernible, and the origin of the acoustic nerves was normal.

Two Cases of Necrosis of the Cochlea.

Dr. Thies, assistant in the aural clinic of Dr. Trautmann, of Berlin, narrates two cases of the above-named disease (*Archiv f. Ohrenheilkunde*, Bd. xxx., September, 1890). Both of these cases furnish the following corroborations of the observations of others in similar occurrences:

1. The total facial paralysis in such cases may disappear after the cochlea is thrown off as a sequestrum, as in one of the cases.
2. The facial paralysis may continue after the elimination of the cochlea. The latter result is the most common.
3. Absolute deafness is the result in the affected ear.
4. Vertigo and subjective noises may continue, even if only slightly.

Ossification of the Membrana Tympani.

An account of this rare occurrence is given by Dr. Habermann, of Prague, having been observed by him in Kohler's clinic (*Prager med. Wochenschrift*, Sept. 24, 1890). A woman, thirty years old, presented symptoms of profound anæmia, cirrhosis of the liver, and pneumonia of the left lower lobe. Post-mortem examination revealed chronic tuberculosis of the apices and of the peribronchial glands, with other grave lesions of the viscera.

The left organ of hearing was examined by Habermann. Nothing abnormal was found in the external auditory canal. The dura mater over the temporal bone was very pale, the tegmen tympani thin, and over the antrum transparent. The membrana tympani had in it a heart-shaped perforation, and was greatly thickened and of a grayish color. Microscopic examination of sections of the drum-membrane revealed numerous bone-cells at a point corresponding to the lower edge of a calcareous spot.

Chronic Circumscribed Inflammation, with a Polyp in the External Auditory Canal, the Result of Pressure from a Wax-plug.

Dr. A. Eitelberg, of Vienna, relates a case of the above-named nature (*Wiener med. Presse*, No. 39, September 28, 1890). The history of the case shows that a chambermaid, twenty-two years old, had suffered for two months with a slight, continuous pain in her right ear. There was no tinnitus nor dulness of hearing. The ear had never been previously affected. Examination of the ear revealed on the anterior, lower wall of the auditory meatus at its outer edge a tumor the size of a pea, which proved sensitive and fluctuating when touched with a probe. The skin covering it was neither red nor swollen; the rest of the skin of the canal also appeared normal in this respect. There was a wax-plug in the fundus of the canal, and after the removal of the latter by syringing the membrana tympani appeared macerated, and a polyp was revealed situated at the inner third of the hinder and lower canal-wall. This growth was about five millimetres long and three millimetres wide, flattened, very red, and looked very much like a pointed condyloma. The ear was then stopped with cotton, and the patient seen in two days, when it was found that the tumefaction at the meatus had disappeared, and all pain in the ear had ceased. The polypoid growth, however, was unchanged and bled upon a slight touch with the probe. This growth was then watched for two weeks, but no treatment was applied to it. As it did not change in any way in this time its pointed extremity was touched with a little chromic acid, which was repeated once five days later. After three weeks absence the patient was again examined, when it was found that the polypoid growth had disappeared.

The writer observes that often such polypoid growths undergo spontaneous involution upon the removal of the irritant from the external ear. Even in this case, Eitelberg does not think the two applications of chromic acid destroyed the polypus, but that it really underwent spontaneous metamorphosis. The chief prompting to the publication of this case was the peculiar causation of the polyp, viz., a chronic circumscribed inflammation in the external auditory canal.

Influenza-otitis.

Ludewig, of Halle, maintains that bacteriological study has not yet settled the identity of grippe (*Archiv f. Ohrenh.*, vol. xxx., September, 1890). The pandemic induced a large number of cases of acute otitis media. In December and January of 1888 and 1889 the number of acute ear cases in the Halle clinic was 39; in the corresponding period of 1889 and 1890 they amounted to 129. There were no pathognomonic characteristics in these cases; hence there was no special form of treatment. "Frequently the inflammation (in the middle ear) attacked the bone, and not infrequently we observed acute caries." One fatal case of consequent pyæmia was observed.

According to the experience in the clinic at Halle, influenza-otitis is sometimes a malignant and life-threatening disease, which, in conjunction with pyæmia and meningitis from empyema of the frontal sinuses, presents the most frequent cause of death, after pneumonia.

DISEASES OF THE LARYNX AND CONTIGUOUS STRUCTURES.

UNDER THE CHARGE OF

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Treatment of the Larynx in Tuberculosis.

In a discussion on the treatment of laryngeal disease in tuberculosis held at the late meeting of the British Medical Association (*Brit. Med. Journ.*, Sept. 13, 1890), Mr. Charters J. Symonds, while approaching the subject from a surgical point of view, which endorsed proper efforts to rid the larynx of local diseases by surgical procedures, called attention to the fact that cicatrization of tuberculous ulceration of the larynx sometimes occurred spontaneously; and he intimated the possibility of such a process having taken place in some of the cases treated by curetting, and frictions with lactic acid. We should feel, however, that a cicatrization in immediate sequence to the procedures mentioned should be undoubtedly attributed to the beneficent influence of the procedure; spontaneous elimination of tubercle and cicatrizations of losses of substance progressing far more slowly.

Mr. Symonds narrated two cases illustrative of spontaneous cicatrization. One occurred under six months' good diet and attractive outdoor exercise and recreation in the country, with recurrence on return to town and a fatal termination. The other cicatrization took place under sedative treatment and the administration of mercury, and remained undisturbed until the patient's death from the constitutional disease; the laryngeal disease having been under observation for two years and three months, its symptoms having existed for more than three years. He referred to a few interesting personal observations of nodular infiltrations, which were partly removed in masses with gouge cutting-forceps, the double curette of Krause, and the remainder submitted to frictions with lactic acid with great benefit. The indications for topical or surgical treatment of laryngeal tubercle are very properly based by Mr. Symonds on the lines followed in the treatment of tubercle in other accessible portions of the body, or, as we should put it, on the general principles of good surgery. One of his conclusions, that endo-laryngeal methods are sufficient to remove and treat the disease in the majority of cases, we cannot endorse. They can be treated, yes; but as to the removal of the disease, as least as it occurs in the United States, that result is limited to a great minority of cases in which the disease is quite favorably located for endo-laryngeal access and rather circumscribed in its extent.

Dr. G. Hunter Mackenzie, of Edinburgh, in continuing the discussion, expressed his approval of the title of the subject under discussion, which included all laryngeal complications in tuberculosis, whether tuberculous, non-tuberculous, or mixed. In considering the possibility of influencing the organism on which the disease depends, Mackenzie has been struck with the enormous numbers and large size of the bacilli in the expectoration from laryngeal tuberculosis as compared with that from purely pulmonary tuberculosis; indicating to him that laryngeal tuberculosis presents an intense—probably the most intense—form of the disease, entirely apart from complications attendant upon its location. He believes that in the presence of extensive pulmonary disease laryngeal tuberculosis should not be subjected to violent or heroic treatment; a belief, we fancy, that is very generally entertained. Sedative topical treatment, symptomatic in its selection, is the only topical treatment for which Mackenzie sees any justification.

The simple laryngeal catarrh of pulmonary tuberculosis is regarded as a contra-indication to sojourn in high latitudes, which tends to its aggravation.

Tuberculosis in coexistence with syphilis is believed to occur more frequently than is generally supposed. It would be diagnosed by occurrence of tuberculous bacillary sputum in the presence of evidences of syphilis of the larynx, the mouth, and the parts adjoining.

Mr. Henry T. Butlin had found his best results in frequent insufflations of iodoform, combined with general remedies. Under this treatment he had known what appeared to be complete recovery in a severe case of pharyngeal and laryngeal tubercle. He had no experience with electrolysis or with curetting.

Mr. E. Clifford Beale had frequently noted adherence for weeks of small masses of inspissated mucus associated with catarrhal lesions of ordinary phthisis. He suggested that these localized lesions are liable to become the seats of tuberculous infiltration if neglected or allowed to pass undiagnosed. In most cases perfect cure could be effected by simple cleansing.

Dr. Greville Macdonald doubted whether all superficial excoriations of the larynx were necessarily tuberculous in tuberculous subjects. He had often observed their spontaneous cicatrization.

The views of other participants in the discussion were mainly in accord with the views of those who opened it. There was a general concurrence as to the impropriety of tracheotomy except when indicated for the immediate or immediately proximate preservation of life in cases with pronounced pulmonary lesion, its performance as a therapeutic measure being generally condemned.

Spontaneous Recession of a Laryngeal Papilloma after Tracheotomy.

Dr. W. M. Cowgill, of Paducah, Ky., reports (*Medical News*, October 4, 1890) an instance of an extensive papilloma in the larynx of a girl six years of age, whose difficulty in breathing had existed for four years. The intense dyspnœa required relief, so laryngo-tracheotomy was performed and a canula was inserted. It was subsequently found impossible to remove the growths through the natural passages, and thyrotomy was proposed for gaining access to them, but was objected to by the parents. Little, if any, change ensued for two years. Then evident recession had begun; and in three years and eight months after the tracheotomy it had progressed to such a degree as to leave but a small papilla about one line in length projecting from the posterior wall of the larynx.

CARCINOMA OF THE LARYNX.

At the late International Medical Congress MR. HENRY T. BUTLIN, of London, read a paper "On Radical Operations for the Cure of Intrinsic Carcinoma of the Larynx" (*Brit. Med. Journ.*, August 23, 1890), in which, after reviewing the results in a statistical compilation of 102 operations for intrinsic carcinoma on 95 patients, including 23 thyrotomies, 23 partial excisions, and 51 complete laryngectomies, he concludes that the only hope of success in laryngectomy lies in the first operation, and if this fails there will be little prospect of relief from surgical interference.

He would urge the smallest operation consistent with the widest excision of the disease and the removal of wide area of surrounding tissue, without reference to the removal of one-half of the larynx or the whole organ. He deems it essential to this end that the larynx should be widely opened and examined; for the disease almost invariably occupies a wider area than is disclosed under laryngoscopic inspection.

RHINO-PHARYNGEAL MYXOMA AT SIX YEARS OF AGE.

DR. ALEXANDER MACCOY, of Philadelphia, has reported (*N. Y. Med. Journ.*, Sept. 27, 1890) an instance of myxoma weighing six drachms, which he removed with the electro-cautery snare from the free surface of the vomer of a female child six years of age.

[Myxomas at this early age are very rare. A few weeks ago a rhino-pharyngeal myxoma with multiple attachments, in a boy five years of age, was exhibited and operated upon with forceps at the compiler's clinic in Jefferson Medical College.—ED.]

STENOSIS OF THE LARYNX FROM FOREIGN BODY WITHOUT CHARACTERISTIC SYMPTOMS.

DR. E. KOSSOW-GERRONAY reports (*Wien. med. Woch.*, No. 35, 1890) a case of sudden asphyxia in a patient who had suffered for four weeks with laryngeal pain, hoarseness, and cough, and who had expectorated shreds of membrane. Immediate tracheotomy, artificial respiration, and injections of ether restored the patient. Laryngoscopic examination then disclosed a foreign body beneath the left vocal band, projecting across one-half of the diameter of the trachea. It was subsequently removed by DR. SCHOPF after splitting the larynx, and it turned out to be an embedded fragment of bone surrounded and partially overgrown with granulations. There was no clinical history whatever of the aspiration of the foreign body.

A CURED CASE OF PRIMARY TUBERCULOSIS OF THE PHARYNX.

DR. J. W. GLEITSMANN, of New York, reported (*N. Y. Med. Journ.*, Oct. 11, 1890) to the International Medical Congress at Berlin a case of primary tuberculosis in a female patient thirty-eight years of age, cured by scraping the ulcerating tissues, and energetic frictions with lactic acid, with occasional resort to the electric cautery. Cases of this kind are very rare.

[A cured case of tuberculosis of the pharynx in the compiler's consultation practice was referred to in these columns a few years ago in connection with some pertinent abstracts, but that case did not reach anything like the ravages described in the present instance.]

WITHDRAWAL OF A NEEDLE FROM THE TRACHEA THROUGH THE NATURAL PASSAGE.

An interesting case, very ingeniously handled, has been reported by DR. FRANZ HINRICHS, of Berlin (*Deut. med. Woch.*, Sept. 11, 1890).

A tailor drew a threaded needle into his trachea by aspiration. Laryngoscopically the string projecting from the mouth was seen to extend down the left side of the trachea. The needle lay across the middle of the orifice of the left primitive bronchus, one extremity imbedded in the left wall of the trachea, and the other a little more deeply in the spur of the bifurcation, but it was impossible to distinguish which end was the point and which was the eye of the needle. After failure with a variety of devices at extraction mentioned in detail, withdrawal was accomplished by the following procedure. The point of a long probe was bent into a rectangular hook about half a centimetre in length, and while Dr. Hinrichs held the thread taut, the consultant, DR. SCHIRLER, succeeded under laryngoscopic inspection in passing the hook under the upper end of the needle and in detaching it from the tracheal wall, the point remaining imbedded in the spur of the bifurcation. By means of the sound he was enabled to keep the needle in a proximatively vertical position during its dislodgement by traction upon the thread. During its slow withdrawal it was caught several times under the projections of the rings of the trachea, whence it was as often dislodged with the sound. The last obstacle thus surmounted was the right vocal band. The needle was 3.5 centimetres long, and was rusted to within 1.1 centimetres of the point, and 0.2 centimetre of the eye, the parts imbedded in the tissues having retained their lustre. The operators are to be congratulated on their pluck, skill, and pertinacity, through which they spared their patient the necessity of submission to tracheotomy.

INTUBATION IN SYPHILITIC STENOSIS OF THE LARYNX.

At the late International Medical Congress a paper on Intubation of the Larynx in Acute and Chronic Syphilitic Stenosis (*Med. Record*, Oct. 4, 1890) was read by DR. GEORGE M. LEFFERTS, of New York, strongly advocating the procedure in preference to all others. His personal experience in ten cases is recorded in exemplification of the views maintained in his argument.

PARALYSES OF THE LARYNX.

Two cases of unilateral paralysis of one crico-arytenoid muscle, both in females, cured mainly by progressively increasing doses of strychnine sulphate, are reported by DR. FLETCHER INGALS, of Chicago.—*N. Y. Med. Journal*, Sept. 27, 1890.

UNILATERAL PARALYSIS OF THE ABDUCTORS OF THE LARYNX.

DR. BOSWORTH, of New York, has reported to the American Laryngological Association (*N. Y. Med. Journ.*, Oct. 11, 1890) a case of unilateral paralysis of the abductors of the larynx, the result of an attack of bulbar disease with unusual symptoms, and which was apparently caused by suppurative disease of the antrum. After the establishment of the disease of the antrum there was a history of partial motor paralysis of the entire right side of the body from crown of head to sole of foot, associated with absolute loss of the sense of temperature on the left side, but not of the tactile sense. When Bosworth was consulted for the antrum disease, several months after the onset of the paralysis, from which the patient believed himself to have become thoroughly recovered, he noted some failure to appreciate sensations of heat and cold on the left side of the body. Laryngoscopy revealed the right vocal cord lying motionless in the middle line, in a condition of complete paralysis of its abduction. Otherwise the patient was in perfect health, and gave no evidence of any impairments or the ordinary muscular tests of spinal and bulbar disease. Bosworth believes that there had been a thrombosis of one of the small arteries of the medulla in consequence of suppurative disease of the maxillary sinus; and that early reëstablishment of the circulation relieved all the paralytic effects save that of abduction of the right vocal cord; the diseased process seeming to have isolated the ganglion which presides over the respiratory function of one side of the larynx.

LARYNGECTOMY.

At a recent meeting of the *Berliner medicinische Gesellschaft*, DR. EUGENE HAHN exhibited a specimen from a patient upon whom he had performed a very extensive operation in 1880. Regional recurrence took place nine years later, and the patient died in 1889 at the age of seventy-eight years. A portion of the hyoid bone, one-half of the larynx, and one-half of the epiglottis had been removed. He also mentioned a case in which he had been compelled to excise a portion of the carotid artery and a portion of the internal jugular vein in order to remove the entire disease. Recurrence ensued, and the patient perished by purulent bronchitis and pneumonia some ten weeks after the operation. This was the only case lost of six laryngectomies Hahn had performed since 1888.

In conclusion, Hahn expressed the opinion that when carcinoma has become so extended as to require extirpation of the entire larynx, it is better, in most instances, to avoid the operation. Favorable results ensue only in those cases in which it is practicable to perform an operation early in the disease.

DERMATOLOGY.

UNDER THE CHARGE OF
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Histology of Tuberculous Skin after Injection with Koch's Fluid.

Gustav Riehl, of Vienna (*Wiener klinische Wochenschrift*, No. 51, 1890), describes the histological changes in a patch of tuberculous skin after the injection of Koch's fluid. Briefly, the changes consist in an acute exudative inflammation with fibrinous and cellular exudation in the immediate neighborhood of the tuberculous infiltration. The changes in the bloodvessels, the formation of vesicles, the abundant presence of leucocytes in the tissues, the deposit of fibrin about the tubercle, in the papillæ, and even into the epidermis, are all signs of inflammation with abundant exudation.

Observations on Koch's Fluid in Dermatology.

Prof. Pick, of Prague (*Prager med. Wochenschr.*, No. 52, 1890), experimented with injections of Koch's fluid in 7 cases of syphilis; 3 of rhinoscleroma; 1 of lupus erythematosus; 1 of Addison's disease. In none of the syphilitic cases was there any reaction upon the neoplasmata, though there occurred general disturbance in several cases. In one case of syphilitic condylomata in association with tuberculosis cutis verrucosa, there took place a strong general reaction, and also an intense local action on both tuberculous deposits, corroborating Koch's assertion of the elective affinity of the virus, and of this point being of diagnostic value. In one case of pure rhinoscleroma there was no reaction, but in two other cases of the same disease with tuberculosis of the lungs there occurred general reaction, but without a sign of local action on the rhinoscleroma. Lupus erythematosus showed no irritation. Because of general reaction in the case of Addison's disease, the idea of tuberculosis of the supra-renal capsule suggested itself.

In a second series of experiments, there were thirteen cases of lupus, of whom the majority showed other internal or external signs of tuberculosis. In all cases the typical local and general reaction took place. Of the general symptoms, the frequent occurrence of diverse exanthemata was noted, including urticaria, measly, roseolar, and scarlatinous eruptions. Alarming symptoms occurred in only one case. Pick thinks that the remedy is one of great scientific importance, of priceless value, and a curative agent for tuberculosis.

Relation of Lupus to Tuberculosis.

Jonathan Hutchinson (*Lancet*, January 17, 1891) does not believe that there is a disease which, to the exclusion of all others, deserves the name of lupus. No symptom or set of symptoms will enable anyone to recognize with certainty all cases of lupus, because the diseases which have been classed under it are not clearly specialized. It is often quite impossible to diagnose between scrofulous ulcers and lupus, and between ulcerating chilblains and lupus, to say nothing of the rare forms known as acne-lupus, sebaceous-lupus, and those cases on the borderland of lupus erythematosus and lupus vulgaris. "Whenever a chronic inflammation of the skin or mucous membrane, not due to syphilis, shows a persisting tendency to spread at its edges, to produce satellites near it, and to leave a condition of scar behind it, such a process is one of lupus." Nothing is less common than to see a lupus-patient pass into phthisis. Thus the infective material, whatever it may be, is one which finds a suitable home only in cutaneous or mucous structures; if a bacillus, it is a selective one, and keeps to the tissue in which it had its first development. The most typical forms of common lupus are often coincident with good health on the part of the patient, and the absence of any family history of tendency to tuberculosis. The connection between tubercular affections and lupus is far less close than is generally believed. No observer has succeeded in detecting the bacillus in lupus erythematosus, yet it is far more frequently in close association with tuberculous conditions than is lupus vulgaris.

The diseases of the skin, other than lupus, which are supposed to be in association with scrofula and specific tuberculosis, may be referred to. The typical form of scrofula, in connection with suppurative disease of the lymphatic glands and cellular tissue and skin, does not usually assume the conditions known as lupus, but in most instances they are distinct. If lupus is a tubercular disease—*i. e.*, bacillary in origin—it is certainly extraordinary that in gland struma the skin does not assume a lupus-state, nor conversely, that the glands do not suffer in lupus. True tuberculosis of the skin, distinct from lupus and scrofulous ulceration, as described by French and German writers, seems to be almost unknown in Mr. Hutchinson's vast experience. He alludes to the affection. Lichen scrofulosorum is referred to, and is considered scrofulous in nature and distinct from lupus. Lupus verrucosus, the author states, cannot be distinguished from verruco-necrogenica; the latter occurs in persons not otherwise scrofulous, and does not lead to infective tuberculization in other parts or organs. There is no evidence that lupus ever begins from the implantation of tuberculous matter. Lupus is only exceptionally associated with tubercle in the viscera, and it never causes infective gland disease. Mr. Hutchinson thinks that the evidence is in favor of regarding lupus as a specialized form of chronic inflammation rather than the result of infection.

The Seborrhœic Wart.

Careful study of the seborrhœic wart by S. Pollitzer (*British Journal of Dermatology*, vol. ii. No. 21, 1890) shows the formation to be "characterized histologically by a slightly-thickened stratum corneum, a considerably hypertrophied Malpighian layer, and in the papillary and subpapillary layer, the occurrence of epithelioid cells, arranged in groups and lines separated by bundles of connective tissue, and terminating abruptly below the horizontal subpapillary plexus of vessels; together with a peculiar infiltration of fat, affecting the coil-gland epithelium, the middle and papillary layers of the cutis, and the epithelium of the rete Malpighii; and perhaps an atrophy of the sebaceous glands and hair-follicles." The presence and peculiar arrangement of the epithelioid cells, the author considers, would indicate that the growth could probably be, with propriety, classed as a lymphangio-fibroma (Recklinghausen).

Some of the Rarer Effects of Pediculi.

Jamieson notes (*British Journal of Dermatology*, vol. i. No. 10) the somewhat rarer effects produced by pediculi under the two headings—Local: 1. Maculæ cæruleæ; 2. Pigmentation. And Reflex: 1. The presence or absence of itching; 2. Pyrexia.

The so-called maculæ cæruleæ, or taches blenatres, are steel-gray, pea-to-finger-nail sized stains occasionally to be seen on the trunk and the inner aspects of the thigh and arm. They were formerly thought to be indicative of fever, but observation and experiments have shown them to be due to pediculi pubis.

The brownish pigmentation is not uncommon, and results from the hyperæmia produced by the continual irritation of the pediculi corporis and the consequent scratching. It is usually brownish, but exceptionally may be almost black.

As to the reflex effect, itching is the rule, but in a few instances it has been entirely wanting; and, according to Jamieson, in those cases which show maculæ cæruleæ. Pyrexia has been noted in rare cases, the temperature reaching several degrees above normal, which has entirely subsided after a bath and change of linen. Two such cases are briefly referred to. The pyrexia, apparently, was due to peripheral irritation; in neither of the cases was there any inflammation of the skin.

OBSTETRICS.

UNDER THE CHARGE OF

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Cæsarean Section at the Rotunda Hospital, Dublin.

Macan (*Dublin Journal of Medical Science*, p. 361, 1890) reports the first Cæsarean operation at the Rotunda Hospital in one hundred and thirty years. The patient was a primipara, three feet seven and a half inches tall, and with a considerably contracted pelvis, the true conjugate being two inches. The usual Cæsarean operation was performed, the uterus being closed by silk by the method employed by Fritsch, and an elastic ligature having been used to control hæmorrhage. An uncomplicated recovery followed the operation.

THE CÆSAREAN OPERATION.

GOULLIOUD (*Archives de Tocologie*, No. 11, 1890) reports a case of Cæsarean section in a woman presenting a contracted pelvis, the true conjugate measuring two and one-third inches, the shoulder presenting, the amniotic liquid having escaped eighteen hours before admission to the hospital, and the child still living. Basiotripsy had been performed a year previous upon the same patient. On examination it was found impossible to make version, and accordingly Cæsarean section was done. The uterus was closed with chromic-acid catgut. The sero-serous suture was carefully made with fine catgut, and the usual antiseptic dressings applied. The patient's temperature and pulse rising after the operation, the lower angle of the wound was opened, and a rubber drainage-tube inserted and antiseptic injections were made. Recovery of mother and child followed.

MENINGEAL HÆMORRHAGE IN THE NEWBORN.

RICHARDIERE (*La Médecine Moderne*, No. 44, 1890) reaches the following conclusions from a medico-legal study of cases of meningeal hæmorrhage in the newborn: These hæmorrhages are a frequent cause of death, and occur at the moment of birth. They differ from similar hæmorrhages in the adult by the absence of inflammation of the arachnoid and of the dura mater. They are usually accompanied by sub-pleural ecchymoses. Death generally results suddenly. The cause of the hæmorrhages is traumatism occurring during labor, and especially traumatism upon the fœtal head at the moment of its passage through the bony pelvis.

THE TREATMENT OF PLACENTA PRÆVIA.

HART (*Edinburgh Medical Journal*, p. 416, 1890) defines a normal insertion of the placenta as being above the level of the lower uterine segment. Placenta prævia exists in those cases where part of the placenta dips into the lower uterine segment. He would not call hæmorrhage in such a placenta accidental hemorrhage, but would restrict the term to bleeding caused by separation of the placenta when normally situated. He has found by observation that although the arterial supply of the lower uterine segment is not increased in placenta prævia, the venous circulation is markedly so.

Regarding treatment, it is of cardinal importance to prevent loss of blood. Prolonged interference should be avoided, thorough antisepsis maintained, and the interests of the mother held to be paramount. When definite hæmorrhage has come on, chloroform should be given, the cervix dilated to admit two fingers, bipolar version performed and a foot brought down, and delivery should be allowed to proceed spontaneously. Rupture of the membranes is admissible only in minor cases. Regarding the plan of complete dilatation with Barnes's bags and rapid delivery, Hart believes that it increases the chances for the child's life at the risk of the mother's. In selecting methods of stimulation, he places first repeated subcutaneous injections of sulphuric ether. The patient should drink hot water in considerable quantities. Fluid enemata may also be given. In severe cases auto-transfusion should be performed by bandaging the legs. The best method of direct transfusion is the injection in the infra-clavicular or inter-scapular regions of six-tenths per cent. salt solution at a temperature of 100° F. A simple funnel with India-rubber tubing and needle are all that are requisite. In post-partum hæmorrhage after placenta prævia the tampon of iodoform gauze will be found of value.

THE INTRA-UTERINE TAMPON AFTER PLACENTA PRÆVIA.

AUDREY (*Archives de Tocologie*, No. 10, 1890) reports two cases of placenta prævia in which hemorrhage persisted after the delivery of the fœtus, and was checked by the use of a tampon of iodoform gauze after the failure of other methods. The tampons in each instance were allowed to remain undisturbed for twenty-four hours, and in both cases uncomplicated recovery ensued.

RUPTURE OF THE MEMBRANES TWENTY-FIVE DAYS BEFORE THE BIRTH OF A LIVING CHILD.

EGAN (*Medical Record*, p. 457, 1890) reports the case of a multipara who had had four miscarriages, the causes of which had not been ascertained. When the os was dilated to the size of a dollar, the head presenting, the membranes ruptured. The pains were trivial in character, and the head receded and descended alternately. A hypodermic injection of half a grain of morphine in four doses produced a night's rest. The pains continued ineffective, and the patient resumed her household duties until twenty-five days after the rupture of the membranes, when a living child was expelled. But one opening could be found in the membranes.

PUERPERAL ENDOCARDITIS AND ITS PULMONARY COMPLICATIONS.

LUZET and ETTLINGER (*Archives Générales de Médecine*, January, 1891) have found that puerperal endocarditis of septic origin occurs most frequently upon the right side of the heart. The infection spreads thence to the lungs. The course of the disease is prolonged, and its duration several months. Pulmonary complications are the rule. They are caused by multiple septic emboli, whose formation and deposit occur so slowly as frequently to give rise to a diagnosis of tubercular disease. When the infection is mild in character the patient very often survives.

A SECOND TUBAL GESTATION DIAGNOSTICATED AND REMOVED BEFORE RUPTURE.

HERMAN (*British Medical Journal*, No. 1552, 1890) reports the case of a multipara from whom he had removed a ruptured tubal pregnancy from the right side. Over three years afterward ectopic pregnancy upon the left side of the uterus was diagnosticated. Upon laparotomy the pregnancy was found to be tubal and unruptured. The tube was removed, and measured two and a half inches long, and one and a half inches at its widest part. It contained a fœtus one third of an inch long. The wall of the tube was three-eighths of an inch thick, resembling the placenta in ectopic gestation. The case is interesting from the diagnosis made before rupture; the occurrence of ectopic gestation in first one tube and then the other, and the duration of the pregnancy, which was about three months. The embryo had died at the end of the first month, and hæmorrhage had taken place into the chorion.

THE TREATMENT OF SYPHILIS DURING PREGNANCY.

BESNIER (*Journal de Médecine*, November, 1890) has obtained good results in the treatment of syphilis, during pregnancy, by the administration of cinchona wine and syrup of the iodide of iron as tonics, together with nourishing food. The patient also took daily a pill containing one-sixth of a grain of bichloride of mercury combined with one-twelfth of a grain of extract of opium and one-twelfth of a grain of extract of gentian, the whole rubbed up with glycerin. Iodide of potassium was also advised in amounts of from seven and a half to fifteen grains daily.

RECENT RESULTS FROM THE STUDY OF LABOR BY FROZEN SECTIONS.

BARBOUR (*British Medical Journal*, No. 1557, 1890) concludes from the study of frozen sections of a patient during labor, that the retraction of the uterus changes remarkably the thickness and consistence of the uterine wall. These walls are always in apposition, except when the placenta and membranes remain in the upper uterine segment. After their removal the uterine walls come into apposition. Regarding the diminution in the size of the oblique diameters at the pelvic brim, he finds that, excluding a loop of intestines, the thickness of the soft parts at both ends of the oblique diameters is in all about seven-eighths of an inch. In estimating, then, the available space in these diameters, we must deduct almost an inch from measurements made upon the bony pelvis. Below the brim the shortening becomes more marked through the *obturator internus* and the cellular tissue of the broad ligament containing venous sinuses. These sinuses are compressed during labor.

DEATH FROM LATENT HEART DISEASE.

BARTAUX (*Journal des Sages-Femmes*, November 1, 1890) reports the death, three hours after labor, of a well-nourished patient, who had suffered shortly before the end of labor with dyspnœa and failing heart-action, which treatment did not relieve. An old endocarditis was found in the left ventricle and the mitral orifice greatly contracted. Extreme pulmonary congestion with nutmeg-liver and beginning sclerosis of the kidney were present. Thirteen years before her last pregnancy the patient had rheumatism and endocarditis with valvular affection. The amount of hypertrophy was slight; pregnancy had resulted in heart-strain, and variation in blood-pressure caused by labor terminated in the death of the patient.

Ovarian Gestation.

A case of this rare pregnancy is reported by Reeves (*Lancet*, p. 872, 1890). The patient was a multipara, who complained of pain from a pyriform tumor in the centre of the abdomen, which was smooth and tense, and projected anteriorly. This tumor was not connected with the uterus. Her history was that of previous miscarriage with derangement of menstruation, and irregular flow followed. Fœtal movements were felt, and attacks of sudden pain had been experienced. The uterus was enlarged. On laparotomy a cyst was found in the centre of the abdomen which, when punctured, yielded three ounces of thick, yellowish fluid. The sac was then opened, and a dead child and a macerated placenta were delivered. The broad ligament was then tied in a double ligature close to the uterus. No trace of the ovary upon the left side could be found; the right ovary was sclerotic and was left. The pedicle was treated within the abdomen, and a glass drainage-tube was employed. A further examination of the case revealed an ovarian, ruptured pregnancy.

Tubal Pregnancy with Rupture at an Early Stage.

Draper (*Boston Medical and Surgical Journal*, January 8, 1891) reports a case of tubal pregnancy in a young primipara admitted to the hospital in shock from ruptured tubal pregnancy. The case proved rapidly fatal, and upon post-mortem examination three quarts of blood were found in the peritoneal cavity. The tissues were blanched from loss of blood; the location of the ovum was found in the left Fallopian tube. Microscopic examination revealed a ruptured ovum at between the first and second months.

A Case of Ectopic Gestation with Operation at the Ninth Month.

Cushing (*Ibid.*) reports the case of a primipara in whose abdomen a large irregular mass could be outlined. A placental souffle could be heard but no fœtal heart-sounds. Upon laparotomy a cyst was discovered. The peritoneum was very thick and vascular, the lower portion of the sac was formed of the Fallopian tube adherent to the surrounding tissues. The upper half of the placenta was in a state of fatty degeneration, and was easily removed, the placenta tearing readily. The remaining portion was retained in the fœtal sac, but was removed without severe bleeding, and the sac stuffed with iodoform gauze. The Fallopian tube was ligated, and the abdominal cavity thoroughly washed out with hot water, and two drainage-tubes were inserted. The patient's recovery was uneventful. Examination showed that the child was between eight and nine months advanced. It had apparently died from twist of the cord near the umbilicus.

The Proteids of Milk.

Halliburton (*Journal of Physiology*, vol. ii., No. 6, p. 463) arrives at the following conclusions from an interesting study of the proteids of milk: The principal proteid called *caseinogen* is precipitated by certain neutral salts, or by acetic acid, and may be most satisfactorily prepared by combination of these two methods. The term *casein* should be applied to the curd formed from caseinogen by the action of rennet. In the classification of proteids, casein should be grouped with other insoluble proteids like fibrin and gluten formed by ferments from more soluble albuminoids. Caseinogen should be placed in a new group including it and the proteid of whey. These bodies are similar to the globulins, the chief difference being that their solutions are not coagulated by heat. Lact-albumin resembles closely serum-albumin; it differs, however, in specific rotatory power, in its heat-coagulation and its precipitation by neutral salts. Caseinogen and lact-albumin are the only proteids contained in milk. Other proteid bodies supposed to have been isolated in milk have not existed as such. The body called *whey*, a proteid formed in rennet fermentation, should be included with caseinogen in a new class of proteids allied to the globulins.

THE CAUSES AND TREATMENT OF POST-PARTUM HÆMORRHAGE.

SCHAUTA (*Prager medicinische Wochenschrift*, No. 53, 1890) writes of the treatment of post-partum hæmorrhage in a practical and interesting manner. In seeking for the cause of hæmorrhage, the practitioner must remember that while atony of the uterus is the most frequent cause, yet others may be present of equal importance. Such are failure of the uterine muscle properly to retract and close the mouths of the uterine sinuses; dilatation, degeneration, and atheroma of the bloodvessels of the uterus; retained portions of placenta; lacerations of the genital tract opening bloodvessels; varicose veins which have been ruptured during labor; bleeding from rupture of the uterus at the lower uterine segment; tumors, especially myomata and carcinomata, which become bruised and lacerated during labor. In the treatment of these cases it is essential that the placenta be delivered in such a manner as best to avoid uterine relaxation and hæmorrhage. Schauta wisely advises that no effort be made to express the placenta during the first half-hour following delivery; he would even adopt Ahlfeld's suggestion, and allow two or three hours to elapse before removing the placenta manually. The Credé method is preferred when expression is possible.

In the treatment of hæmorrhage caused by uterine atony, uterine massage is indicated and also hot douches; these are best given of sterilized water, or of some antiseptic solution, bichloride of mercury not being considered applicable in these cases. Ergotine may be given by hypodermic injection; the intra-uterine application of styptics is strongly condemned. The intra-uterine tampon of iodoform gauze is warmly commended, and has given none but good results in Schauta's hands. In cases where a hæmorrhage is persistent and severe, the blood coming from degenerated vessels in the site of the placenta, it may be necessary to adopt a procedure advised by Kocks. This consists in inverting the uterus as soon after the birth of the child as possible, and applying an elastic ligature about the cervix. In addition, iodoform gauze may be used as a tampon. After six hours the elastic band may be removed and the uterus replaced. When hæmorrhage results from retained portions of placenta, the thorough exploration of the uterus and the removal of such portions will promptly check the hæmorrhage. Hæmorrhage from lacerated wounds in the genital tract is best controlled by suture, or ligature, or by a gauze tampon. In the treatment of the anæmia following hæmorrhage, the transfusion of dilute saline solutions is especially commended. Schauta describes a case where, after laparotomy, severe hæmorrhage resulted; four hours after the operation the abdomen was again opened, and large clots and fresh blood were found. The hæmorrhage was checked, and the threatening anæmia of the patient was relieved by transfusion with salines.

POLYURIA DURING PREGNANCY.

VOITURIAZ (*Archives de Tocologie*, No. 12, 1890) reports the case of a primipara who suffered after the fourth month of her pregnancy with polyuria. The density of the urine was 1011, no abnormal condition being discovered by chemical or microscopic examination. Labor was somewhat prolonged by reason of the size of the child, and the forceps was used. Almost immediately after labor the polyuria disappeared. The writer suggests that its origin was reflex stimulation of the action of the kidneys occasioned by distention of the uterus.

SPONTANEOUS DELIVERY IN A CASE OF PARIETAL PRESENTATION IN A SMALL PELVIS.

CHALEIX (*Archives de Tocologie*, No. 11, 1890) reports the case of a primipara, aged seventeen years, with a small pelvis, antero-posterior diameter of the inlet being eight and a half centimetres, or three and a half inches. When dilatation was complete, the sagittal suture was found extending across the pelvis, the left parietal bone presenting at the pubes. As the patient's pulse, temperature, and general condition remained good, and the fœtal heart-sounds gave no indication of danger, no active interference was practised, the patient receiving warm vaginal douches of a saturated solution of boric acid. After a labor which lasted nearly forty-eight-hours, spontaneous delivery occurred. The fœtal heart-sounds were heard up to the time when the expulsion of the fœtus began, but during expulsion the child perished. On examining the fœtal head its condition was found to be as follows: The antero-posterior diameters were considerably increased and the transverse notably diminished in length. The *caput succedaneum* was found upon the left side of the cranial vault; the internal border of the left parietal bone, the anterior, was pressed strongly beneath the border of the right parietal bone; at the border of the left temporal fossa there existed a marked depression a sixth of an inch in area. At the moment of expulsion the occiput rotated beneath the pubes.

TWO CASES OF INCOMPLETE BREECH PRESENTATION, WITH THE USE OF FORCEPS.

PORAK (*Bulletins et Mémoires de la Société Obstetricale, etc.*, No. 12, 1890) reports two cases of breech presentation in which the breech remained unfolded. Delivery was effected in one by the employment of the hands, while in the other the forceps was applied to the sides of the child's body, the blades fitting over the trochanters. The latter method has been employed by Tarnier in a number of cases, and has resulted favorably in his hands. Porak concludes from a study of his cases that the forceps may be applied to the pelvis of the fœtus, the tips of the blades extending a little beyond the crests of the ilia to advantage. The blades should be applied in the bis-trochanteric diameter, the trochanters fitting into the fenestræ.

RIGIDITY OF THE CERVIX UTERI DURING LABOR NECESSITATING THE APPLICATION OF FORCEPS; LACERATION OF THE ANTERIOR LIP.

LOVIOT reports (*Ibid.*) the case of a primipara, aged twenty years, with whom it was necessary to apply the forceps. The perineum and pelvic floor were uninjured, but upon the anterior lip of the cervix uteri was torn transversely a piece of the tissue, and a portion about an inch square was entirely severed. The patient made an uninterrupted recovery, the cervix healing during the puerperal state.

THE CAUSATION OF PLACENTA PRÆVIA.

SCHRADER (*Zeitschrift für Geburtshülfe*, Band 19, Heft 1) describes the case of a multipara who had had a severe labor previously, during which version and extraction were necessary. This happened some time before the present pregnancy; the cervix uteri was lacerated. In her next confinement she suffered from hæmorrhage found to be caused by a placenta prævia. This, however, was not sufficiently severe to jeopardize the life of the patient. The cause for the abnormal attachment of the placenta was found in an excessive dilatation of the lower portion of the uterus with the firm union of the placental reflexa with that of the uterus. This has already been pointed out by Kaltenbach.

GYNECOLOGY.

UNDER THE CHARGE OF

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THE ELECTROLYSIS OF UTERINE FIBROMYOMATA.

ZWEIFEL (*Deutsche med. Wochenschrift*, October 2, 1890) regards this treatment as entirely symptomatic, and as such it must be acknowledged that it is superficial to any other palliative means, either medical or surgical. There is no doubt that the growth of the tumor may be arrested by galvanism, though sometimes this is noted only while the patient is under treatment; hence follows relief of certain pressure-symptoms. The hæmostatic action of the current is most striking. The writer has obtained better results with mild currents, as thirty milliampères, than with those of one to two hundred milliampères, and believes that they accomplish about the same as curetting and cauterization of the endometrium, and that the electrical treatment, though longer, is less dangerous. It must not be forgotten that proper cases are to be selected, else valuable time may be lost in trying to relieve a patient by electricity who must eventually be brought to the operating-table, too late for the successful performance of myomotomy. The writer believes, with Apostoli, that the effect of the positive pole within the uterus is purely a local cauterization, the chlorine which is set free exerting a powerful antiseptic action.

THE TECHNIQUE OF OPERATIONS FOR VESICO-VAGINAL FISTULA.

MARTIN (*Proceedings International Medical Congress*, 1890) describes a case of fifteen years' standing in which the entire vesico-vaginal septum with the upper portion of the urethra was missing, the cervix uteri being deeply torn. Two unsuccessful attempts at closure were made. After rendering the urine acid and healing the extensive erosions on the external genitals, the writer undertook to close the fistula. An incision was made through the healthy vaginal mucous membrane surrounding the opening; the laceration of the cervix was then closed, and the flap of vaginal mucosa was slid over the fistula and the opposite edges united. The raw surface in the anterior vaginal wall was next covered as in an anterior colporrhaphy. In spite of the amount of cicatricial contraction, and the presence of an intense vesical catarrh, the wound healed with the exception of a small opening in the cervix, which it was easy to cure by a subsequent operation. The disposition of the flap was similar to that employed by Volkmann in the operation for ectopion vesicæ.

ELECTRO-THERAPY IN GYNECOLOGY.

PROCHOWNICK (*Ibid.*) has applied this treatment carefully in 110 cases, with the following results: Fourteen patients with uterine fibromyoma were treated, seven on account of hæmorrhage, which was checked with either arrest of growth or diminution in the size of the tumor; three applied on account of pain and were entirely relieved. The applications were repeated at intervals of from three to five days and were continued for two or three months. The writer believes that this treatment is absolutely free from danger so long as one practises rigid antisepsis and avoids galvano-puncture, refraining from downward traction upon the cervix. Assuming, with Martin, that 80 per cent. of all fibrous tumors are of a benignant character, perhaps one-third of these may be successfully treated with hot injections, ergot, hydrastis, etc. The remainder, especially growing tumors associated with pain and hæmorrhage, are best treated by electricity. Too few have yet been kept under observation for several years to enable us to determine if the benefit is permanent after cessation of the treatment. Apostoli himself admits that many patients have a recurrence of their symptoms after the lapse of a year, or a year and a half. The fact that some fibroids become cystic can hardly be attributed to the use of the continuous current, since this change may occur even where no treatment has been instituted. Some fibrous tumors continue to grow in spite of treatment, others are associated with malignant degeneration of the endometrium, and many become malignant or rapidly undermine the general health; in these cases there is no alternative save a radical operation.

Twenty-two cases of chronic perimetritis, associated with ovarian and tubal disease, were treated with more or less success. In twelve cases, in which a gonorrhœal history was absent, pain and hæmorrhage were the principal symptoms; eight were permanently relieved by a current of 100 to 150 milliampères (the greatest number of *séances* being fifteen), two could not bear the treatment, and in two cases it was necessary to perform laparotomy. Less favorable results were obtained in the case of the ten patients whose condition was due to gonorrhœal infection; five were entirely relieved, two somewhat, and in two fresh inflammation was set up. Of course it is not claimed that an anatomical cure takes place in cases of pyosalpinx, although the tumor sometimes appears to grow smaller, but the distressing pains, hæmorrhage, and vaginal discharge are certainly relieved, and frequently. Greater care must be used in the introduction of the sound than in cases of fibromyoma, and more attention must be paid to the after-treatment of the patient. The current used in the treatment of perimetritis should not exceed 150 milliampères. The writer did not continue the treatment longer than three months, giving two *séances* a week; his patients were made to rest for two hours after each application.

THE GALVANIC CURRENT IN GYNECOLOGY.

APOSTOLI (*Ibid.*) states the following as his present views upon the subject:

1. The principal value of the constant current is in its action in cases of fibroid tumors and endometritis, especially where pain and hæmorrhage are constant symptoms. It not only arrests the growth of benignant tumors, but promotes the absorption of peri-uterine exudations. It is absolutely contra-indicated in acute suppurative inflammation of the adnexa.

2. The galvanic current possesses a polar and an interpolar action, the latter being of a trophic and dynamic character, the former thermic and antiseptic.

3. The more powerful currents (above fifty milliampères) possess these advantages: *a.* They influence the circulation through the development of heat (*drainage circulatoire*). *b.* They are antiseptic and germicidal. *c.* Their effect increases as the square of current-strength. *d.* They can be easily employed by the general profession. *e.* The stronger the current employed the less the probability of a return of the symptoms.

4. Intra-uterine galvanization is preferable because by it the maximum effect is obtained, the antiseptic action of the positive pole is secured, direct cauterization is effected, and there is less pain than in the intra-vaginal method.

5. In proper cases galvano-puncture by means of a fine gold needle, insulated up to within one-fifth of an inch of its point, enables the operator to concentrate the action better and to produce a more powerful effect with weak currents.

6. As compared with the application of caustics and curetting, intra-uterine galvanization is far more harmless, as shown by the writer's experience, who, between July, 1882, and July, 1890, had practised the latter 11,499 times with only three fatal results—once in a case of galvano-puncture for subperitoneal fibroma, once in a case of galvano-puncture for salpingo-

oöphoritis, and once where the same treatment was employed in the case of an ovarian cyst, which was mistaken for a fibroid. In thirty instances pregnancy followed the use of intra-uterine applications.

THE RESULTS OF TREATMENT BY APOSTOLI'S METHOD.

CUTTER (*Ibid.*) calls attention to the fact that in 1871 he treated a case of uterine fibromyoma by galvanism, following essentially the method subsequently developed by Apostoli. In his experience he had found that the growth of the tumor was arrested in 50 per cent. of his cases, that there was slight improvement in 6 per cent., no diminution in the size of the tumor in 14 per cent., and more or less complete disappearance in 22 per cent. His mortality was 8 per cent. With the patient anæsthetized, he introduces both electrodes through the abdominal wall into the tumor and allows the current to pass for five or ten minutes, rest in bed being enjoined for several days subsequently with restricted diet, two-thirds meat and one-third vegetable; diet he regards as extremely important.

DRAINAGE AFTER LAPAROTOMY.

SÄNGER (*Med. Anzeiger zum Centralblatt für die ges. Medicin*, August 30, 1890) reviews the literature of this subject, tracing the evolution of drainage from Koeberlé to Hegar. Drainage may be effected by glass tubes, by tamponade with absorbent gauze, or by the two combined. The writer prefers the latter method, using slightly-curved tubes with a diameter of two-fifths of an inch, having small, lateral perforations one-twenty-fifth of an inch in diameter; these are boiled and are kept in a solution of bichloride, 1 : 500. After removing the fluid from the tube, previous to applying the dressings, it is stuffed with aseptic gauze, which is not changed for twenty-four hours. No syringe is used to withdraw the fluid. The drainage-tube is removed on the third or fourth, though occasionally not until the sixth or eighth day. The writer believes that drainage acts as a "safety-ventilation," allowing the discharge of secretions which, if retained within the cavity, would serve as a nidus for septic infection.

The use of a gauze-drain alone has certain disadvantages, since the portion within the pelvic cavity soon becomes soaked and ceases to act as a capillary drain; it is then impossible to change it, since if it is drawn out the fluid is squeezed back into the cavity. Even when it is necessary to tampon on account of obstinate oozing, it is better to use a glass tube with the gauze. It is not necessary to resort to "ventro-vaginal drainage," as recommended by Martin in cases of myomectomy, since all secretion can be thoroughly removed through the abdominal drain.

Drainage should be employed under the following circumstances:

1. When there exist at the time of the operation circumscribed collections of blood or decomposed fluid, which exceed in virulence the absorptive power of the peritoneum. 2. When it is probable that there will be a subsequent secretion of fluid which may serve as a focus of infection. 3. When there has been an injury to the bladder or gut and there is a chance that their contents may escape into the cavity. 4. When it is desirable to shut off large raw surfaces from the general peritoneal cavity.

PÆDIATRICS.

UNDER THE CHARGE OF

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INVERTIN FERMENT IN THE ANIMAL ORGANISM.

According to MANFREDI (*Jahrb. f. Kinderh.*, xxxi. 1 and 2), there are various opinions, and there have been various expressions, as to the occurrence and origin of invertin ferment in the stomach and intestinal canal. It is generally admitted that such a ferment, a product of glandular secretion, exists in the intestinal canal, and by some that it also exists in the stomach. The fact that numerous bacteria possess the properties of invertin, and that this ferment has even been separated from them, makes it quite possible that it may be generated by them in the intestinal canal. The author's paper is based upon investigations upon the intestinal canal of the guinea-pig and the dog in order to determine this question. His method consisted in taking intestinal secretion, and an infusion of the intestinal mucous membrane, also a filtrate of both freed from bacteria by Chamberland's filter, and testing it quantitatively as to its invertin action upon solutions of cane sugar. The following are his conclusions:

1. The presence of numerous bacteria, which are the source of invertin in the intestinal canal, in connection with the constant presence of the ferment in the intestinal secretion, demand new investigations in regard to the digestion of cane sugar.

2. Previous investigations upon this subject are of no value, partly on account of faulty methods, and partly because commercial cane sugar always contains a small quantity of glucose.

3. The causes of the so-called spontaneous production of invertin from cane sugar and its solutions are the microörganisms which are derived from the air and may possibly be converted into invertin. Spontaneous conversion into invertin can be prevented by careful sterilization, the use of five per cent. carbolic acid solution, filtration through Chamberland's filter, and precautions against germs of all sorts.

4. Invertin is not produced in the stomach where under normal conditions there is no development of bacteria. Those opinions are erroneous which hold that invertin may be produced in the stomach by the action of the acid of the gastric juice, by the gastric mucus, or by a particular gland secretion.

5. In the intestinal juice, which normally contains many bacteria susceptible of conversion into invertin, this substance is constantly found in considerable quantity. In the guinea-pig it is exclusively due to the action of microörganisms. In the dog it probably has a similar origin.

6. In other organs, especially in the liver, the ferment is not present.

7. In solutions or mixtures made by combining portions of all the organs

of the body, the gastric mucous membrane alone being excepted, also in mixtures of all the secretions of the body, invertin may be found if the mixtures are exposed to the air long enough for the development of bacteria.

STERILIZED MILK AND ITS USE IN NOURISHING CHILDREN.

In an article on this subject EISENBERG states that (*Jahrb. f. Kinderh.*, xxxi. 1 and 2) a danger in the use of animal milk for the nourishment of children consists in the fact that unless it is taken by the child immediately after being drawn from the udder of the animal it will contain germs which are the result of decomposition and fermentation.

Pasteur showed that the decomposition of milk is effected by germs which exist in the air, and that these germs possess activity to a marked degree.

Hueppe showed that there were two varieties of such germs—acid-forming and lab-forming, and that perfect sterilization could easily be accomplished. Soxhlet devised an apparatus by which a given quantity of milk could be reduced to a proper consistency by boiling in a water bath for forty minutes. Hochsinger devised a plan for sterilizing milk for infants on a large scale, and it can now be obtained in the shops thus prepared. By the author's method of sterilizing milk for family use, a suitable metallic frame with places for twelve bottles is provided. These bottles being graduated in cubic centimetres, the milk may easily be reduced to the desired consistency. The bottles are provided with stoppers which seal them hermetically, and are to be boiled in a water-bath for thirty minutes. The nipple must be adjusted to the bottle immediately before it is to be used. After use the bottles should always be washed with soda, sand, and water.

THE PHYSIOLOGY OF STOMACH-DIGESTION IN INFANTS.

VAN PUTEREN reports the following experiments (*Jahrb. f. Kinderh.*, xxxi. 1 and 2): The contents from the stomachs of 248 healthy breast-nourished infants obtained by irrigation, were utilized in the author's investigations. Their ages varied from two to forty-one days. In all, 1027 examinations were made. A simple Jaques catheter introduced into the stomach, and lightly pressed against its wall, was used in the experiments for determining the quantity and quality of the acid- and lab-ferments of the stomach. Washings of the stomach with distilled water at 35° C. were used in determining peptonization, and the duration of digestion, and in the latter procedure a glass cock, with double bore and containing three glass tubes, was employed. The contents of the stomach were withdrawn at intervals of ten or fifteen minutes during the period of digestion. The author considered the following points:

1. Duration of ingested milk in stomach. Sixty to eighty grammes were taken by each child during the first month of life at each meal. The contents of the stomach could be easily withdrawn during an hour and a half following their ingestion. Irrigating with distilled water they could be obtained for two hours and twenty minutes, providing that not less than twenty to forty grammes were taken at a meal. This material thus obtained was not alkaline, and contained no bile, hence was from the stomach. The

quantity in the stomach diminished rapidly during the first hour, and in two hours there were not more than twenty to thirty cubic centimetres, this disappearing slowly during the next half-hour.

2. The contents of the stomach were less decidedly acid than is the case in adults. Increasing acidity was evident as digestion progressed, 741 filtrations being made. The acidity was most marked ninety-five minutes after eating.

3. Character of the acid contents of the stomach: Methyl-violet gave positive results for hydrochloric acid, and Uffelmann's reagent for lactic acid. During the first two months of life hydrochloric acid is that which is normal for the stomach.

4. Anti-fermentative power of the stomach contents: Plate cultures were made at once, and after two hours withdrawal of material withdrawn immediately after nursing and at various subsequent periods, the nutrient medium being a mixture of skimmed milk, albuminate of soda, and eight per cent. of gelatin. No perceptible difference was observed in the microörganisms obtained by the two methods.

5. The presence of lab-ferment: The tests which were used gave a negative result with infants under twenty days old; with somewhat older ones there was weak coagulation, while the influence of lab-ferment was very plain in infants of from twenty-nine to forty-one days.

6. The peptonization of albuminates: Ewald's method was accepted, according to which albumen was seldom found, and only in the course of the first hour. Peptone and syntonin were present from twenty-five minutes after eating until the end of digestion. Propeptone was found in thirteen out of fifty-three cases. Sugar and fat were always found, but as long as peptone was present in the stomach the fat could not be converted into fatty acids b the action of ether.

This method of investigation has heretofore been little used for the study of the functions of the infant stomach. Raudnitz and Leo have studied the subject in this manner—that is, by irrigation of the stomach and examination of the washings, but only to a limited extent. The author's investigations have been far more extensive, and he has given exact data in regard to the presence of hydrochloric acid. He has also been able to deny the presence of lactic acid under normal conditions. He was unable to verify Leo's statement as to the presence of lab-ferment in the infant stomach prior to the twenty-fourth day. Further studies on this subject are very desirable.

THE MECHANISM OF RESPIRATION IN THE NEWBORN.

In discussing this subject VON DOHRN gives the following (*Jahrb. f. Kinderh.*, xxxi. 1 and 2) conclusions:

1. The breathing of newborn infants is mainly thoracic.

2. In forced respiration, the raising of the thorax begins at the upper part and extends downward.

3. The exchange of air in the newborn, in ordinary respiration, averages thirty-five cubic centimetres, and increases with forced respiration to a maximum of one hundred and twenty cubic centimetres. In the newborn the exchange of air is about a quarter of the entire volume respired, while in adults it is only about one-tenth.

4. On the first day of life the change of air is very small in volume; it increases until the third day, and then sinks a little, subsequently rising again. At the end of the first week its volume is about one-quarter greater than on the first few days.

5. The lungs are not filled with the first few respirations, as a rule, the alveoli not being well distended until about the second day.

6. The respiration-curves in the newborn show no pauses.

Diabetes Mellitus in Children.

Stern (*Arch. Ital. di Ped.*, 1890) gives the records of 117 cases of this disease in children, found by the author, of which 75 were published prior to 1876. Since many cases are never reported, it can hardly be said that the disease is a very rare one. The disease was found to be more frequent in females in the ratio of 5 : 3. Among adults males are more frequently attacked. Six of the 117 cases were seized during the first year of life, the others between the first and fifteenth years. Heredity was an important etiological factor, neuropathic as well as diabetic tendencies in parents predisposing to the disease. Other etiological factors were Werlhoff's disease, measles, malarial fever, cold, typhoid, and the excessive use of sugar. There may be a traumatic origin, especially if blows have been received upon the head. The quantity of urine passed may range from 1500 to 4000 grammes daily. Albumin as well as sugar may be in the urine, and there may be a trace of acetone or aceto-acetic acid. In the cases analyzed there was little elevation of temperature. With some there was anæmia, with others eczema, furuncles, abscesses, caries of the teeth, labial herpes, lingual psoriasis, and scrofula. The hearing was sometimes affected, and there were several cases of cataract. Indigestion was not infrequent, but the heart and bloodvessels were seldom affected. In a number of cases death was preceded by diabetic coma. The duration in 35 cases varied between two days and five years. In 14 cases there was complete cure, in 7 improvement, in 4 no improvement, and in 52 the result was fatal. The treatment is mainly a matter of diet. The carbonates and salicylates may be beneficial, but there is no certainty in the matter.

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A CASE OF LEUCOCYTHÆMIA IN A CHILD.

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AND
Robert Muir, M.D.,
ASSISTANT TO THE PROFESSOR OF PATHOLOGY OF EDINBURGH UNIVERSITY.

G. R., aged seven years and eleven months, brought to the out-patient room of the Sick Children's Hospital, on December 16, 1889.

Complaints: Enlarged glands in neck, susceptibility to catching cold, weakness, lassitude, and pain after eating.

Family history: None of any importance elicited. Father, mother, and five sisters all healthy.

Previous health: Severe eczema soon after birth, which lasted for eighteen months; with this exception, has been tolerably strong and healthy. No infectious disease until eighteen months ago, when he had an attack of diphtheria, lasting six weeks. About a year ago had "bronchitis and inflammation of the lungs," from which he recovered perfectly. For more than six months has had scabies all over the body (practically untreated), which may account to some extent for some of the glandular enlargement. Three months ago seemed quite well, and about that time walked ten miles in one day without being overtired.

Present illness: About two months ago his mother noticed that he was paler than usual, that he had no energy, and that his appetite was poor and capricious; also, that he frequently complained of abdominal pain. He has become steadily weaker since then. One month ago he walked five miles, but was extremely tired after doing so. Three weeks ago the enlarged cervical glands were noticed for the first time, after a bad cold. He has had no hæmorrhages.

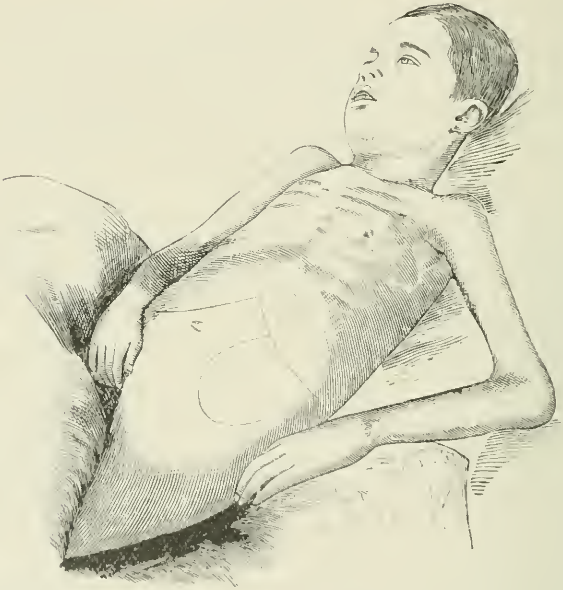
Examination. (December 26, 1889.)—Rather a small boy for his age (weight three stone thirteen and a half pounds), very pale, yellowish, waxy complexion. Marked swelling in front of each ear, and noticeable fulness of lymphatic glands on both sides of the neck and below the lower jaw. Constant short cough. Temperature (axilla) 99.8°.

Lips and gums very pale. Teeth large and good, except molars, which are carious. Tongue pale, flabby, moist, with prominent fungiform papillæ. Tonsils pale, moderately enlarged.

Appetite very poor, and capricious; constant thirst. Frequent discomfort and giddiness after food; occasional vomiting. Bowels regular.

Abdomen: Inspection (Fig. 1): Very full and distended, especially in the hepatic region. Palpation: Soft liver-edge felt distinctly about two and three-quarter inches below costal margin, in right nipple-line. In the left hypochondrium a hard body is felt coming out from below the ribs. It seems continuous with the liver, but its edge is much harder. It reaches one and a half inches below the edge of the ribs, in the left nipple-line. (When the abdominal distention subsided a little, this was found to be the enlarged spleen.) Extending downward from the left hypochondrium, a large, oblong, solid mass is felt: the lower end is rounded and superficial, and extends fully an inch below the anterior superior spine, while the upper end is deeply situated, and cannot be touched by the hand. (It was found afterward that this tumor did not move with respiration; and it turned out, post-mortem, to be the left kidney.) No enlarged glands felt; no ascites. Percussion (Fig. 2): Liver dulness begins above at the upper margin of the fifth rib in the right nipple-line, becomes absolute at the sixth rib, and extends down about seven inches, to two and three-quarter inches below the costal margin.

FIG. 1.



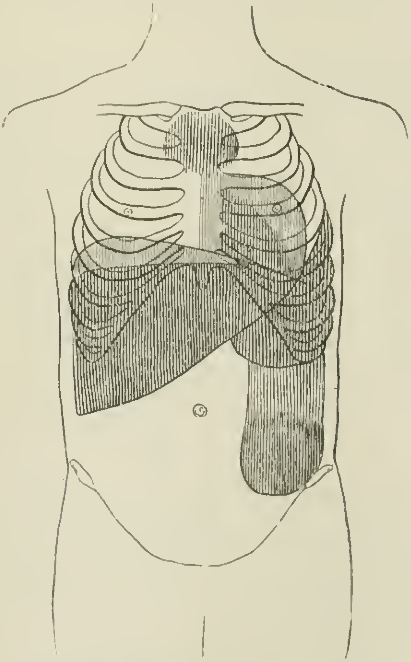
Lymphatic glands: Almost all those which can be felt are more or less enlarged. They are soft, separate, and painless. Those in the parotid region form a prominent tumor on each side of the face, like half a small Tangerine orange. Several of the submaxillary lymphatic glands on each side are enlarged to the size of a hazel-nut. The sub-occipital, mastoid, supra-hyoid, superior cervical, and both sets of deep cervical glands, are enlarged, varying in size from that of a pea to that of a large bean. Those in both axillæ are large, and the right supra-condyloid is the size of a large pea. There are also numerous large glands in both inguinal regions.

Blood: Hæmocytes, 2,500,000; tolerably normal in appearance. Leucocytes, 125,000; hæmoglobin, 40 per cent. (*v. sub.*)

Heart: No subjective symptoms. Apex-beat in fifth space half an inch outside the left nipple-line. First sound very weak at apex. In pulmonary and auricular areas first sound is replaced by a soft, blowing murmur when the child is sitting up. "Bruit de diable" at root of neck. Pulse 128, weak, but regular.

Thyroid gland not enlarged. Thymus: Over the manubrium sterni there is a large patch of dulness, which reaches down below the junction of the second costal cartilages, and for more than an inch on each side. (Fig. 2.)

FIG. 2.



Lungs: A few rhonchi at bases; otherwise normal. Urine pale acid, low specific gravity, no albumin, no sugar.

Fundus oculi: Arteries small and pale, veins large and flat, no hæmorrhage, discs normal.

THE TREATMENT aimed at was the administration of arsenic, in as large doses as possible. Fowler's solution was given in doses of from ♏j to ♏v, but had always to be stopped after a few days, owing to the repugnance to food, vomiting, and diarrhœa, which it invariably produced. Iron (ferrum redactum) was also tried repeatedly with similar bad result. Faradism was applied to the abdomen on several occasions. The first few applications were certainly followed by improvement in the general condition, but latterly no effect was produced.

PROGRESS. (A) *The Blood* (by Dr. Muir).—At first (January 3d) the red corpuscles showed comparatively little change in appearance. They varied in size more than usual (6 to 8.5 μ), but they formed rouleaux well, and few were of irregular shape. The white corpuscles were seen in great numbers between the rouleaux. They varied greatly in size (6 to 11.5μ), but by far the greater number were 6 to 8 μ—*i. e.* the increase was chiefly of the small variety of leucocyte. They were quite circular, and practically all were finely granular. In stained preparations it was found that nearly all the leucocytes were of the small uninucleated variety, the proportion of multinucleated leucocytes, which in normal conditions are more abundant than the former, being very small. These uninucleated corpuscles varied considerably in size, and the single nucleus generally showed no structure beyond a finely granular appearance, with faint markings, and in some it was slightly indented at one side. Eosinophile cells were seen, but they were very few in number.

The blood-plates were at first of nearly normal number, and of the usual appearance.

In the progress there are to be noted:

(1) A gradual diminution in the number of red corpuscles, which was more rapid as death approached, along with an increased number of irregular corpuscles and greater variations in size. A few nucleated red corpuscles were seen, but only shortly before death.

(2) A gradual increase of the leucocytes, so that their proportion to red corpuscles changed from 1 : 20 to 1 : 25. The uninucleated corpuscles varied more in size, large forms becoming more abundant, and the multinucleated leucocytes became proportionately still fewer.

(3) The number of the blood-plates rapidly diminished.

On several occasions, when faradization was applied to the spleen and lymphatic glands, enumerations of the leucocytes were made before and after the application. On one occasion there was a considerable increase in the number of leucocytes in the blood afterward, on another a slight increase, whilst on the other occasions there was practically no alteration. We therefore concluded that the application was followed by no constant change.

Permanent preparations of the blood in such conditions can be rapidly and conveniently made by drying films on cover-glasses, and staining for thirty seconds in a saturated alcoholic solution of methyl-blue. The films are then washed, allowed to dry, and mounted in balsam. The different varieties of leucocytes, and the nucleated red corpuscles, if present, are thus well seen.

(B) *General.*—On the whole the progress was steadily downward, although for a few days after the first application of the faradic current (January 7th) there was considerable subjective improvement. The glandular enlargements varied a good deal, being some weeks much more marked than others. During the last few days of life the glands were noticeably smaller than before (the photograph from which Fig. 1 is copied was taken two days before death). The left kidney also *seemed* to change considerably in size, becoming, so far as could be felt, about an inch shorter, and then enlarging again. The spleen steadily increased in size, and extended before death at least an inch further down than it did when first seen. The temperature was irregular. During the first fortnight of treatment it was nearly normal in the morning, and from 101.5° to 103° in the evening. Later on, it was frequently subnormal early in the day, and usually from 99° to 101° in the evening. Several hæmorrhages occurred. On December 27th there was severe epistaxis, and on February 2d a slighter attack of a similar nature. On February 3d there was oozing from the gums. Two days before death numerous hæmorrhages were found in both retinæ, along with optic neuritis in the right eye. On December 29th a patch of dulness and crepitation was discovered in the right scapular region, but, with this exception, there were no objective lung-signs. During the last weeks there was considerable distress caused by nasal obstruction, which became almost complete. The tonsils also enlarged somewhat, but not very greatly. The urine continued free from albumin, but, toward the end, contained large quantities of colorless elliptical uric-acid crystals.

On the morning of February 13th the patient became suddenly extremely breathless, although air was freely entering all parts of the lungs. He died in the afternoon of the same day.

ENUMERATION OF BLOOD-CORPUSCLES.

Date.		Hæmocytes.	Leucocytes.	Blood-plates.	Proportion of white to red corpuscles.
December	26th	2,500,000	125,000	. . .	1 : 20
"	30th	2,560,000	93,000	194,000	1 : 26.5
January	3d	2,245,000	112,000	252,000	1 : 20
"	7th	2,260,000	229,000	230,000	1 : 9.8
"	12th	2,145,000	241,000	224,000	1 : 8.8
"	14th	2,170,000	226,000	222,000	1 : 9.6
"	17th	2,085,000	209,000	192,000	1 : 9.9
"	23d	2,031,000	219,000	. . .	1 : 9.2
"	27th	1,992,000	217,000	72,000	1 : 8
"	30th	1,686,360	214,000	19,000	1 : 7.8
February	3d	1,181,250	222,000	7,300	1 : 5.3
"	6th	1,150,000	312,000	19,000	1 : 3.3
"	9th	902,500	379,000	13,000	1 : 2.3
"	12th	721,250	283,000	7,000	1 : 2.5

POST-MORTEM EXAMINATION (twenty-two hours after death).—*Abdomen :* The liver is much enlarged, pale in color, flabby in consistence, apparently fatty on section. There are several minute subserous hæmorrhages in its peritoneal covering. The gall-bladder is moderately distended with pale-green bile. The spleen is much smaller than it was during life, its anterior extremity only reaching forward as far as the anterior axillary line, and its lower border being one inch below the costal margin in the mid-axillary line. Weight, 11 ounces. Size, 6 by 4 by 1½ inches. Capsule smooth, no hæmorrhages. Not very pale in color, consistence rather soft. On section, surface pretty uniform, rather pale; Malpighian bodies not prominent; trabecular tissue apparently not increased. No infarcts.

The left kidney is seen at once on opening the abdomen, as a large oblong body, occupying the left lumbar and upper iliac regions, and displacing the spleen upward. It is crossed about the middle by the descending colon. On removal it is found to weigh 16¼ ounces, and to measure 7 by 3½ by 2½ inches. The capsule is somewhat adherent, the surface extremely pale, mottled, and yellowish. On section the medulla is of a pale reddish cream-color. The cortex is comparatively enlarged, pale yellow in color, and presents numerous little bright-red spots with pale yellowish centres. There are also a number of narrow red streaks between the tubules in the cortex and in the pyramids. There is one small cyst, about the size of a pea, near the lower end of the organ, and at the surface, near its upper end, there is a hard yellow nodule, evidently an old infarction.

The right kidney is not seen until the intestines are removed. It is, however, about the same size as the left one (6½ by 3½ by 2¾ inches), though situated higher up, and it weighs exactly the same, and in appearance, externally and on section, it is very similar. It contains a cyst the size of a small bean, and an old infarction, like that in the other organ.

The intestine seems normal (it was not fully examined). The mesenteric glands vary from the size of a hempseed to that of half a walnut. They are extremely soft. On section, some are of a pale cream-color, and others yellowish-red from hæmorrhage.

The testicles are not enlarged, and seem normal.

Thorax: On laying bare the ribs, a few small, bright-red subperiosteal hæmorrhages are seen just outside the costo-chondroid articulations on some of them. When the thorax is opened, the upper half of the mediastinum is found to be occupied by a somewhat quadrilateral yellowish white mass, of a hard, almost fibrous consistence. It measures 3¾ inches from above downward, 2 to 2½ from side to side, and about 2 antero-posteriorly. On the anterior surface there are several punctiform hæmorrhages. Anteriorly, the upper half of this mass is adherent to the back of the manubrium sterni. Posteriorly, it lies on the aorta and other great vessels, displacing them backward. Above, it tapers off to a point about the level of the top of the sternum. Below and behind it is closely adherent to the pericardium. From the position occupied by this tumor, it seems probable that it is connected with the remains of the thymus.

The pleuræ, both costal and pulmonary, present numerous small hæmorrhages, but seem otherwise normal. No adhesions, no effusion.

The left lung is of a pale color, and on section has a peculiar mottled appearance, due to the occurrence of yellowish-red consolidated patches, about half an inch in diameter (hæmorrhages), which are scattered here and there—there being more in the lower than in the upper lobe.

The right lung has a precisely similar appearance.

The glands at the root of the lung are enlarged, some to the size of a hazlenut. On section some are dark-red, from hæmorrhages into their substance.

The pericardium contains about two ounces of reddish milky serum. There are numerous subserous hæmorrhages into both its layers. It is otherwise normal.

The heart is very pale. All its cavities contain a large quantity of pale, almost cream-colored, soft clot. In the right auricle and left ventricle there is also a little black clot. The musculi papillares of the mitral valve show the peculiar striated appearance of fatty degeneration most typically.

The lymphatic glands in the groin and elsewhere present the same characters as those in the abdomen and thorax.

REMARKS.—The main points of clinical interest in the case may be briefly recapitulated:

(1) The rapid course (less than five months) which is characteristic of the disease in early life.

(2) The powerlessness of treatment, which may partially be attributed to the late stage at which the child was first seen, and to the extremely irritable condition of his alimentary tract, which prevented the satisfactory administration of remedies.

(3) The mediastinal tumor, which from its relations may be almost certainly held to have arisen in the remains of the thymus gland, and which is uncommon, although several instances of a similar condition have been published.

(4) The great enlargement of both kidneys, and the fact of the left one forming, during life, such a prominent abdominal tumor.

Abstract of Microscopic Examination, and Remarks. (By Dr. Muir.)

The bone-marrow was of a pale-pink color, but had not that pus-like appearance which has been described in certain cases of leucocythæmia. On microscopic examination, in a 0.6 per cent. solution of sodium chloride, tinted with methyl-violet, it was found that most of the cells were colorless, uninucleated corpuscles of various sizes (6–10 μ) similar to those in the blood. The proper marrow-cells, nucleated red corpuscles, and ordinary red corpuscles were comparatively few in number. The chief change appeared to be a great increase of small uninucleated corpuscles at the expense of the cell elements more strictly belonging to the marrow. In the spleen and lymphatic glands the same cells were seen in great numbers; in the former some were of larger size than in the latter.

In sections of the spleen it was seen that the great increase in size was due to an increase of the cellular elements of the pulp. The Malpighian bodies were small and ill-defined, the trabeculæ were relatively small, and the reticulum of the pulp was scarcely thickened. The cells in the splenic pulp were uninucleated corpuscles of varying size, but most were small. There were no eosinophile cells. Red blood-corpuscles were few in number.

The enlargement of the lymphatic glands also was due to a great increase of the lymphoid corpuscles, and not to any fibrous overgrowth. The corpuscles were most closely packed in the cortex, being in some places very densely aggregated in the lymph-sinus under the capsule. In the medullary portion the tissue was more open, and very vascular. There were no thrombi in the small vessels, but in the chief artery of one of the glands a thrombus was seen composed of mixed layers of leucocytes and a hyaline material. There was no fatty change in the lymphatic glands or in the spleen.

The mass in the upper mediastinum was much more fibrous than the lymphatic glands. It had a stroma of dense bands of fibrous tissue which carried the bloodvessels. These broke up into small bands, between which were spaces filled with lymphoid tissue, in which were many capillaries. There was nothing seen by which it could be identified definitely as the thymus.

The enlargement of the kidneys was seen to be due to an infiltration of its connective tissue with small lymph-corpuscles. This infiltration was pretty uniform in the cortex, where it separated widely the tubules and Malpighian bodies. In the boundary area and in part of the medulla it was arranged in cord-like masses which ran along the vessels, the tubules being found running in the spaces between. Toward the apices of the pyramids there was no infiltration between the tubules. There was considerable fatty change in this lymphoid tissue. The epithelium of convoluted tubules was at places detached and granular, but showed no signs of proliferation, and the change was rather degenerative than inflammatory. The glomeruli were practically normal, and contained comparatively few of the small round cells. There were hæmorrhages scattered in the cortex of the kidneys, and in one place was an old infarct which was encapsuled in fibrous tissue, and in which could be seen the necrosed tubules separated by degenerated lymphoid corpuscles. This showed that the infiltration of the connective tissue must have lasted for a considerable time.

In the liver there was a somewhat similar leucocytic infiltration extending along the portal spaces, and pushing out between the liver cells. There was fatty degeneration of the cells, chiefly around the central vein of the lobule. Some of the liver cells contained yellowish pigment, which did not blacken with sulphide of ammonium.

The muscular fibres of the heart showed extensive fatty degeneration, and the connective tissue under the endocardium was infiltrated with small lymphoid corpuscles. The clot in the heart was composed of numerous uninucleated leucocytes closely arranged, between which were delicate fibrin filaments.

In the lungs many of the smaller vessels were filled with leucocyte thrombi, and the neighborhood of such vessels was often the seat of hæmorrhage. Where hæmorrhage had occurred most of the air-cells were filled with red corpuscles, with leucocytes intermixed, but some were packed almost entirely with leucocytes. This arrangement was probably brought about by the influence of gravity on the corpuscles in the effused blood, or it might have been due to the giving way of vessels which were plugged with leucocytes, these being poured out into the nearest air-cells. The parts of the lung free from hæmorrhage showed dilatation of the alveolar capillaries, which contained many leucocytes, and, in some of the air-spaces numerous round catarrhal cells, many of which contained granules of brownish pigment. The peri-bronchial connective tissue and many of the septa were densely infiltrated with small leucocytes, and the infiltration could be traced along the bronchi to the glands at the root of the lung which were affected like the other glands. Some parts of the pleura were infiltrated in the same way, some were quite free. No part of the lung showed fatty change.

I also examined a specimen of ordinary connective tissue (taken from the neighborhood of the aorta), and found an abnormally large number of lymphoid corpuscles in its lymphatic spaces.

REMARKS.—Of the various pathological changes found, some are evidently secondary in character. Such are: the fatty degeneration in several situations, but most marked in the muscular fibres of the heart, the hæmorrhages in the kidneys, lungs, etc., the clotting within the heart, and the plugging of the pulmonary vessels with leucocyte-thrombi. The essential change is the presence of an enormous number of uninucleated leucocytes in all situations where these are normally present. These situations are—(1) in the blood, (2) in the spleen, bone-marrow, and lymphatic glands, (3) in the lymph-spaces of the connective tissue in various organs and parts of the body, *e. g.*, the connective tissue of the kidney (where the phenomenon is most marked), the portal tracts in the liver, the peri-bronchial and subpleural connective tissue in the lung, the subendocardial connective tissue in the heart, and, as an example of ordinary fibrous tissue, the connective tissue along the aorta. Such a condition can only be explained, I think, by an active proliferation of these uninucleated corpuscles. The cells found in the tissues have most probably passed out of the bloodvessels, as they are most numerous around these, though they may proliferate after doing so. The lymphatic glands are, I think, infected secondarily from the tissues, through the afferent lymphatics, and accordingly we find the corpuscles most closely packed in the cortical lymph-sinuses. In fact, given the condition of the tissues as found in this case, we could almost predict such an affection of the glands. I have also seen a case in which the change in the blood was of the same nature as in the present case, though less advanced, whilst the lymphatic glands were not affected, or only very slightly. Hence, though in cases of leucocythæmia in which the glands are affected, the leucocytes, as a rule, are mostly of the small uninucleated variety, the change in the glands is most probably not the cause of the leucocythæmia, but the effect of it. It is difficult to determine the exact starting-point of the proliferation, nor is it so important as the determination of its cause. I have been unable to find microorganisms in this case, though Fermi[1] has cultivated a bacillus from a spleen in leucocythæmia, and Kelsch and Vaillard[2] have found a similar organism in the blood and in leucocytic deposits, and have made cultivations of it. In both instances the lymphatic glands were affected. The theory that a microörganism is the cause of the proliferation of the leucocytes would be in accordance with the facts, and would be rather favored by the course of the temperature in this case.

The anæmia I consider to be due to the occupation of the blood-forming area in the bone-marrow by these leucocytes, with consequent diminution of the nucleated red corpuscles, etc., rather than to a failure of transformation of leucocytes into red corpuscles; it being now generally held (and my own observations support the view), that the leucocytes in the blood do not become red corpuscles.

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[1] Fermi, Centralb. f. Bakt. u. Parasit., vol. viii., November 18, 1890.

[2] Kelsch and Vaillard, Annales de l'Institut. Pasteur, 1890, p. 276.

A CASE OF SUCCESSFUL REMOVAL OF A RETRO-PERITONEAL FATTY TUMOR.[1]

IN THE COURSE OF THE OPERATION A VEIN, SUPPOSED TO BE THE LEFT COMMON ILIAC, TORN AND TIED.

By John Homans, M.D.,
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It has been my fortune to meet with several large fatty tumors in the abdomen and on the thigh. Three of those in the abdomen weighed over fifty pounds, and two in the thigh weighed over ten pounds each, and extended from Poupart's ligament to the patella.

The case which I report is interesting, as being the only one of its kind which has been successfully removed by laparotomy, or perhaps I ought to say that I can find none reported.

The patient was a woman, fifty-four years old; married. She was the mother of five children, the youngest being thirteen years old. On the day I first saw her she was, in general appearance, rather pale and anxious-looking; there was no œdema, and but slight emaciation. On examination, the abdomen was found uniformly distended, and enlarged to the size of a five months' pregnancy. There was a rounded, smooth, rather hard, non-fluctuating tumor filling the pelvis and rising nearly to the umbilicus. The abdomen was tympanitic, except just below the umbilicus over an area the size of the palm of the hand. On deep pressure a larger area of dulness was found. Both flanks were tympanitic. On auscultation, no aortic sound nor impulse was heard. There was slight tenderness in the left flank. The parietes were moderately thick. The tumor was very slightly movable. The girth at the umbilical level was thirty-one and a half inches. The uterus was pressed downward and backward, and could not be decidedly separated from the tumor. Bimanually the tumor was found to be slightly movable, non-fluctuating, and rather flabby-feeling. The urine had a specific gravity of 1009, and contained a large trace of albumin and numerous hyaline and granular casts, pus, and renal epithelial cells.

Since the change of life, twelve years before, at the age of forty-two, she had been troubled by frequent vomiting, usually in the morning; and for the past three weeks it had been almost incessant. It was for the relief of this symptom that she entered the Massachusetts General Hospital. Her father and one sister had died of phthisis. About a year before her entrance she had noticed a "lump" in the lower part of her abdomen, about the size of an egg, and had not noticed any special change in its size since; she had been losing flesh and strength during the past five months. My dignosis was uncertain. I did not think the tumor ovarian, and probably not a fibroid of the uterus, and I said frankly that I could not make an exact diagnosis, but that I thought it my duty to open the abdomen and see what the tumor was. If the renal symptoms and the vomiting were caused by the pressure of the tumor, they could be relieved by its removal; if they were caused by chronic interstitial nephritis, then the woman would prove a poor subject for a surgical operation, and the result would, perhaps, be fatal.

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[1] Read before the Boston Society for Medical Improvement.

On March 18th, 1889, I opened the abdomen by an incision about five inches long. I found the tumor to be covered by two layers of peritoneum, and encapsulated. I divided both layers of peritoneum and put a corkscrew into the tumor, but it tore its way out, and the fragments coming with it were seen to be fat tissue. The capsule was then split open and the tumor shelled out comparatively easily; smaller lobules or tumors were then seen between the spine and sacrum and peritoneum, extending down into the pelvis. Several of these smaller tumors were shelled out of their capsules and attachments with considerable difficulty. In separating them, a vein on the left brim of the pelvis, the size of an ordinary little finger, and which I took at the time to be the left common iliac, but which may have been the internal iliac, was slightly torn, and bled very freely. I seized the vein in pressure forceps and tied it with silk above and below the hole—several other bleeding points were tied with catgut. Other small lobules were seen, which apparently ran down to the right buttock. The abdominal cavity was sponged out, and the wound closed without drainage. The uterus and its appendages were apparently normal. The intestines were not seen. The estimated weight of the whole mass was about five pounds. Dr. W. F. Whitney, Curator of the Warren Museum, reported that the growth was composed entirely of fat tissue. She had one-fifth of a grain of morphia five hours after the operation; she vomited once on the 18th and once on the 19th of March, and never afterward. The temperature never rose above 100°; her left leg did not swell, nor has the circulation in it ever been impaired. I hunted her up and found her in her lodgings, doing all her own work, on December 8, 1889, more than six months after the operation. She had never vomited after her return home, and was robust and strong. I obtained a specimen of the urine, and found it to be still slightly albuminous. On October 15, 1890, I received a note saying that her health was fairly good, except for symptoms which might be attributed to the renal disease.

I have purposely refrained from reporting this case earlier so that I might learn if the cure was permanent. So it is, as far as the tumor is concerned and the relief to the vomiting, but, of course, the renal troubles may increase at any time. Most of these large, fatty tumors are myxo-lipomas, as was the case in the two that I removed some years ago, and reported in the London *Lancet*. It is, however, the position of these tumors, and not their structure, that makes them difficult of removal. I have seen four retro-peritoneal lipomata. Two were in men and two in women. Three were removed; in two the results were fatal, and in one successful. In the fourth the diagnosis was confirmed by autopsy. Operations for the removal of these tumors, if they are very large, are likely to be fatal, because they extend up and down the spine in the retro-peritoneal space, often behind the liver and stomach. They are, however, of rare occurrence.

At my request, Dr. Lorini has examined all medical literature to November 21, 1889, at the Medical Library in Washington, under the care of Dr. Billings, and but two cases similar to the above have been found. In both of these cases operations were attempted, and resulted fatally. Perhaps other cases have been operated upon, but they have not been published. The first case was that of Dr. F. Walser, and the second that of Dr. H. H. Mudd.

"*Retro-peritoneal Lipomata.*—Dr. F. Walser (*Allg. Wiener med. Zeitg.* No. 6, 1881, p. 63.)—Female, aged thirty-four years. Menstruated at seventeen years. Married at twenty-two years. Four children. Tumor in left side of abdominal cavity, movable in front, apparently fixed behind. Enormous expansion of abdomen. Patient was tapped several times, but no fluid obtained. Later an opening was made with a thermo-cautery in left iliac region, and a lobulated tumor, apparently made up of fat, was exposed, and was removed, excepting a small part of it. Death occurred two days later.

"Autopsy: The tumor was found to have filled the entire left half of the abdominal cavity, involving the sigmoid flexure of the colon. The mass was adherent to the peritoneum throughout, and was found to have grown from the thickened subserous cellular tissue of the same. A microscopic examination of the tumor showed some layers of stripes of myxomatous tissue rich in cells, penetrated by numerous capillary vessels. The greater part of the tumor was, however, infiltrated with fat.

"Diagnosis: Lipoma myxomatodes (myxoma lipomatodes) subperitoneale."

"H. H. Mudd (*Weekly Medical Review*, St. Louis, July 6, 1889, p. 4).—Mrs. M. B., aged seventy-one years. Menstruation ceased at her fifty-ninth year. Patient refused operation at first, but finally consented. Exploratory incision June 20, 1889. It revealed what the author took for a retro-peritoneal fatty tumor, and the incision was closed. Patient seemed but little disturbed by the operation; sat up in bed next day, but maintained recumbent position most of the time, and died June 25th, five days after the operation, of œdema of the lungs and exhaustion.

"Autopsy: A large fibro-lipoma filled the abdomen. It sprang from the posterior wall, and occupied and was adherent throughout to the right lateral region from the liver to the brim of the pelvis, and to the median line from the cœliac axis to the sacrum, and also to the upper portion of the left posterior abdominal wall, its firmest attachment being along the spine. The pyloric end of the stomach, the duodenum, and pancreas were imbedded in the mass; the spleen was lifted forward with the pancreas, and was adherent to the tumor. The small intestine and colon, pushed over to the left side posteriorly, occupied the lower part of the peritoneal cavity. The lower end of the ileum was imbedded in the anterior part of the tumor, so that the head of the colon was adherent. Both kidneys were displaced and surrounded by the tumor, the right carried downward and forward in the tumor, fully a foot from its normal position, the left deeply within the substance of the tumor. The left portion of the fore edge of the liver was closely adherent to a fissure in the mass. Bladder, uterus, and broad ligament were free. No ascitic fluid. Tumor lobulated, with lobuli varying in density. Weight, sixty-three pounds. No adhesions of the peritoneal surface, and no evidence of local irritation at the site of the exploratory incision."

Other cases of fatty tumors of the abdomen have been reported. One in which Sir Spencer Wells operated seems to have been a retro-peritoneal lipoma, but Sir Spencer remarks that: "The tumor appeared to have originated in the mesentery." The patient died fifty-eight hours after the operation, and the post-mortem appearances are described by Mr. J. Cooper Forster, as follows:

> "Woman, aged forty-three years; single. Exploratory incision was made, revealing the tumor to be a mass of fat. Closed the opening and awaited consultation for further treatment. Patient suffered very little pain, and it was decided to remove the tumor. Done on November 5, 1867, when masses of fat were removed after dividing a loose cellular capsule. A large lobule was felt in the neighborhood of the right kidney, but was not disturbed. The tumor appeared to have originated in the mesentery. (November 5, 1867.)
>
> "Appendix: May, 1868.—Patient died fifty-eight hours after the operation. On post-mortem examination, traces of recent peritonitis were observed. Mass of fat on the left side involved the right kidney, pushed the ascending colon over to the left, and adhered to the under surface of the liver. Many mesenteric glands were enlarged and enveloped in fat. There was not more fat than usual in the omentum. The weight of the portion of fatty tumor removed during life was twelve pounds, or thereabouts, but it was not weighed. Uterus and ovaries both healthy."

Another case reported by Mr. J. Cooper Forster, is to be found in the *Transactions of the Pathological Society*, London, vol. xix. page 246. It is therein entitled:

> "Fibro-fatty Tumor of the Abdomen, weighing fifty-five pounds. Woman, aged sixty-three years. Paracentesis abdominis performed several times, but no fluid found. No operation was further attempted. Patient lived sixteen days after last paracentesis, and died from apnœa.
>
> "Autopsy: Viscera healthy; occupying the whole abdomen was the enormous mass, weighing fifty-five pounds when removed, *not attached by any pedicle or well-marked root to one spot.* It was evidently composed of fat and fibre-tissue, lobulated as an ordinary fatty tumor, but not quite so greasy."

It is possible that this may have been a retro-peritoneal tumor, but there is nothing in the autopsy to indicate from whence the tumor grew, and it may have been omental fat.

Case of Dr. Reeves Jackson, of Chicago. Paper was read at morning session (second day) of the American Gynecological Society. Abstract of it to be found in the October number of the *Transactions* of that Society, page 1057. The case is one of *fatty tumor of the supra-renal capsule.*

> "Woman, aged thirty-eight years; American. Married twenty years; five children. Operation November 25, 1888. Author concludes:
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> "This is the only fatty tumor of the supra-renal capsule which I can find on record that has been removed before death. It weighed twenty pounds."

The cases of Pean mentioned by Jackson are not relevant, being mesenteric lipomata.

In the discussion which followed the reading of Dr. Jackson's paper, Drs. S. C. Gordon, C. C. Lee, and Fordyce Barker stated that they had seen similar cases, in all of which operation had been followed by death. It seemed strange to them that the removal of a simple lipomatous mass should prove so extremely fatal. These cases have been looked for in vain, and probably were never published.

SPURIOUS PREGNANCY.

A CRITICAL TREATISE FROM A PRACTICAL EXPERIENCE.

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Though by no means rare, cases of spurious pregnancy are always of interest. Thus it is that, having had under observation three well-marked examples of this curious phenomenon, I venture to bring forward this short treatise on the subject. To briefly state the cases, they are as follows:

Case I.—Nullipara, aged forty-six, married many years, ceased menstruating, and in due course quickened, and developed a prominent abdomen. She was also a martyr to severe "morning sickness." The local medical adviser naturally pronounced her pregnant, and it was arranged that she should be confined in this city. Suitable apartments, nurse, etc., were accordingly engaged, and the lady came to town a month before the expected date of the confinement. At that time, upon casual observation, her advanced pregnant state seemed quite apparent. Labor pains arrived with the utmost precision upon their specified date, and upon being called in to manage the labor my consternation can be better imagined than described when I state that I found the uterus small and retroverted, while on percussion the abdominal tumor gave a tympanitic note. The announcement of the condition, I need hardly say, was a great blow to the would-be parents, a direct heir being in great demand to inherit their not inconsiderable estate.

I may add that, on careful examination, except the distended abdomen, no further signs of pregnancy were apparent, the breasts being small and flaccid, while no areola was manifest. Upon complete anæsthesia the abdominal swelling completely subsided.

Case II.—A multipara, aged forty-eight, sent to the Maternity Hospital for a "doctor" (student), as she was about to be delivered of her thirteenth child. A tyro was accordingly sent, accompanied by the orthodox duet of nurses. They, after a long and watchful night, became alarmed at a little hæmorrhage which was taking place, and sent for assistance. On arrival I found the woman to be suffering from a pretty advanced carcinoma of the cervix, and quietly telling her of her mistake was roundly denounced as ignorant.

The signs of pregnancy in this case were not well marked; the abdomen, though distended, felt flabby, while the breasts were soft and flaccid, and contained no milk. The symptoms which had led the woman to believe herself pregnant were the cessation of menstruation and (apparently) active fœtal movements, associated with other minor symptoms which she had found to be associated with her previous pregnancies.

CASE III.—A multipara, aged thirty-six, four children, youngest six years, considered herself pregnant about eight months, and came to consult me about her courses, which she said had continued through her entire pregnancy without any irregularity. She dated her period of pregnancy from the time of quickening, and a number of other minor symptoms, morning sickness, etc., which she knew from experience as indicative of that condition. Upon examination the abdomen was distended quite in accordance with the date of the pregnancy. It felt tense and hard, but gave no resonant percussion note. The breasts were large, heavy, and full of milk, which could be squeezed out in considerable quantity with ease. The uterus was normal in position, and slightly enlarged. On passage of the sound it entered 3½ inches, while a small fibroid was situated in the anterior wall. When told of her mistake my statement was received with incredulity, and even at the present moment she believes she was pregnant, but that I "took it away" when I put her under chloroform—for some further observations I wished to make—at a later period. The patient stated that the fœtal movements were well marked, and at times even troublesome, while for four months she suffered more than usual from morning sickness.

After such an experience as detailed, one cannot, I think, agree with Pajot and Charpentier when they say "there is no such thing as spurious pregnancy." The cases before us simulated pregnancy, and it alone, in so far as it was possible without being the actual condition. No other state, either physiological or pathological, could be mistaken for it on subjective examination even by the veriest tyro; therefore, to me it appears strange and worthy of notice that two so well known and eminent authorities should make such a statement in the face of so many similar recorded cases.

Granted that there is such a condition, we naturally turn to inquire what the condition is, and how it comes about?

Many explanations have been given regarding the first query, such as wind in the womb, flatulent distention of the intestines, and excess of fat in the omentum.

Any of these, however, must be considered to be far short of the whole truth when we know that, in the great majority of cases, complete anæsthesia entirely dissipates the abdominal tumor. Evidently, then, the abdominal distention is in many cases entirely due to muscular contraction of a more or less complex nature.

The muscles chiefly involved are the recti, obliques, and transversalis abdominis. These, if contracted, will give a decided prominence to the abdomen, a state of matters which was quite new to me till one day, after tapping a patient (for the fifty-second time, I may add) who was suddenly seized with a violent cough, with the result that the abdomen was protruded in a most marked manner: a process which was repeated, (although with much more prominence of the recti) when he attempted to raise himself from the reclining to the sitting posture.

An exactly similar condition was again demonstrated to me by a patient who suffered from severe vomiting immediately after the removal of a large ovarian tumor.

Having these cases on my mind when I saw patient No. III., I determined to try the result of an electric current through the muscles of her abdomen, when they were flaccid during anæsthesia.

The result passed expectation—a faradic current through the abdominal muscles causing the most marked prominence of the abdomen in a manner quite analogous to her condition before anæsthesia.

A similar purely muscular distention of the abdomen I have frequently felt during and after the third stage of labor, which rendered a grasp of the uterus most difficult to obtain.

As a result of this distention of the abdomen the intra-abdominal pressure will naturally be much diminished, and thus allow of much flatulent distention of the intestines—a condition which, being naturally generally associated with the prominent abdomen, has been frequently looked upon as the cause instead of the effect.

Such, then, being an explanation of the factors in this strange process, one naturally looks for an explanation of the prime cause—a much more difficult question.

On looking over the published cases it will be noticed that the great majority of examples have been furnished by women at the menopause, while the others have been associated with disease of the generative organs or vitiated mental conditions. We must, therefore, consider our essential cause primarily as purely nervous, but we can go still further, and subdivide it into two varieties, mental and reflex. The former is generally exemplified by the wish being father to the thought—women at the change of life clinging closely to the cherished ideal of their sex, and relinquishing it with reluctance. But again, it is occasionally due to fear, the result of some illicit intimacy, as is well exemplified by a case described by Gooch.[1]

That it is frequently, however, quite independent of purely mental origin, Cases II. and III. give excellent proof. Neither were desirous of having children; one had already had twelve and was barely able to support them, while the other personally told me she would rather not be pregnant, and seemed grateful at my supposed clandestine removal of the offending member. Both suffered from distinct pathological states of the uterus, and I think we may legitimately infer that the abnormal condition was entirely of a reflex nature—an origin leaving little to imagination, when one considers the intimate nervous relations which exist between the uterus and abdominal muscles in the lumbar plexus.

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[1] Gooch's Diseases of Females, p. 226.

To account for the cause of the other signs of pregnancy in any more lucid manner than by generally attributing them to nervous influences is hopeless; details are a mystery. But if, as is well known, sudden nervous impressions are sufficient to inhibit the secretion of milk, there seems no reason why other nervous impressions may not react in an opposite manner.

An example in the lower animals under my own observation illustrates, in a marked manner, the influence of will in promoting the lacteal secretion. A Dandie Dinmont bitch has had pups three times, the last litter five years ago; since that time, however, she has successfully nursed three litters of Highland terrier puppies, which she appropriated at the earliest opportunity after severe conflicts with the real mother, a weaker dog. Other cases such as this have been recorded by Harvey.[1]

The subject as a whole, though highly interesting and curious from a scientific point of view, demands from a practical standpoint special attention.

No more damaging error of diagnosis can be made than that regarding pregnancy, and none more certain to be revealed, and I might almost say, proclaimed from the housetops. Therefore these cases, though scant, must be of value in teaching how necessary it is to refrain from assenting to a diagnosis of pregnancy, without having satisfied ourselves of at least one *absolute* sign.

THE TREATMENT OF INFLAMMATION OF THE EUSTACHIAN TUBES.

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The great clinical importance of the inflammatory diseases of the Eustachian tube may, perhaps, be best summarized by stating that all ear diseases, not dependent on causes acting from without through the external auditory canal, are dependent on Eustachian lesions. When the enormous frequency of middle-ear affections is considered, it will be admitted that few subjects could be of more interest, not only to the aurist, but to the general practitioner as well.

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[1] Generation of Animals, p. 540.

Simple acute Eustachian salpingitis is a frequent sequel of acute naso-pharyngitis of various types, notably of true acute coryza and the several phases of acute rhinitis associated with scarlet fever, measles, etc. It may exist as an active hyperæmia only, or may go on to deep-seated infiltration and serious inflammation. The phenomena are those of inflammation of any mucous membrane; there is swelling of the mucosa and increased secretion, the exudate containing numerous ciliated epithelial cells. The mucus may be so thick and adhesive as to project from the pharyngeal orifice as a bulla, the masses being of jelly-like consistency and often of considerable size. The gland follicles are also engorged and enlarged, giving a granular appearance to the tubal lips.

The symptoms of acute tubal catarrh are pain, either of an indefinite, dull, heavy character or, in severe cases, the characteristic *boring* pain of "earache," autophony, deafness, and tinnitus aurium. Examination with the rhinoscope shows engorgement, sometimes closure of the Eustachian opening, and in the later stages of severe cases the mucous exudate above described. The nasal mucous membrane shows the "wet-brick" congestion of acute rhinitis, with the usual swelling and occlusion, rapidly disappearing under applications of cocaine. The pharynx shows engorgement of the tonsillar regions in most cases. Inspection of the membrana tympani may or may not demonstrate retraction, with more or less injection of the manubrial plexus of bloodvessels.

The prognosis is complete return to normality under proper treatment, but if the disease is left to run its course some permanent impairment of hearing almost certainly results.

True croupous inflammation[1] of the tube occurs as a complication of pharyngeal diphtheria, usually in fatal cases, the symptoms being those of simple inflammation much exaggerated.

Chronic Eustachian salpingitis is the most common ear disease occurring in the eastern United States, from one-half to three-fourths of the aural cases applying at our clinics, or for private treatment, being sufferers from some stage of this affection. The pathological lesions are persistent hyperæmia and infiltration, with enlargement of the glands and thickening of the sub-mucous connective tissue, from fibro-blastic organization of leucocytes. This may be so extensive that the hypertrophied mucous membrane is thrown into folds and wrinkles at the Eustachian orifice—a most important fact to remember when using the Eustachian catheter in these cases.

The symptoms of this condition are progressive deafness, distressing tinnitus aurium, occasional autophony when the tubes contain mucus, and, under the same conditions, squashing and bubbling sounds in the ear. Although noted in few if any text-books, dull pain, throbbing, and a sense of tension and distention in the ear are among the first and commonest symptoms of this disease. Vertigo, headache and neuralgia are frequent, and phenomena caused by the naso-pharyngitis are prominent. By the rhinoscopic mirror the tubal prominences are found to be swollen, dark-red in color, and the openings are often occluded by tenacious mucus or hypertrophied mucous membrane. Large, prominent veins, similar to those so frequently seen on the pharyngeal wall and epiglottis in long-standing pharyngo-laryngitis, traverse the tubal lips. The nares show advanced rhinitis, and the pharynx gross nodular changes bearing a direct causal relation to the nasal and aural lesions, as I have previously shown.[1] Examination with the ear speculum and mirror (always far less instructive than inspection of the Eustachian region) shows varying degrees of opacity and retraction of the drum, very frequently associated with vasomotor disturbances of the lining of the external canal, cerumen impactions, eczema, etc.

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[1] Wendt: Archiv. der Heilkunde, xi. S. 261.

In patients in whom the catarrhal diathesis is prominently present, usually as an inherited condition, chronic Eustachian salpingitis tends inevitably to progress into true aural sclerosis. The causes are a condition of bloodvessel malnutrition, occasionally associated with gout, syphilis, or tuberculosis, but far oftener seeming to depend on the action of some constitutional poison, as diphtheria, or on some obscure central vasomotor influence.

The symptoms, when advanced cirrhotic changes have occurred, are not obstructive; frequently, on the contrary, the Eustachian channels are widely patulous. Progressive deafness, severe tinnitus, and, as in cirrhosis of other organs—the kidney, etc.—a proneness to acute exacerbations, are characteristic symptoms. The tubal prominences are atrophied, shrunken, yellowish-gray in color, their openings plainly visible; and the use of the Eustachian catheter demonstrates the tube to be too freely open throughout its length. The general post-nasal mucous membrane is papillomatous,[2] fibrous, and anæmic; secretion is usually scanty, with an inclination to form thin, scaly crusts. The respiratory mucous membrane, from the anterior nares to the capillary bronchi, shows inflammation and induration, and the skin, digestive tract, and heart demonstrate the "catarrhal diathesis."

The tympantic membranes show hickening, retraction to "jamming," adhesions, and newly-formed fibrous tissue bands, the function of the drum being often completely destroyed; the tubal muscles also undergo fatty degeneration and atrophy, so complicating and adding to the vicious circle of pathological processes.

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[1] The Medical News, October 22, 1887.

[2] See The American Journal of the Medical Sciences, February, 1889.

The prognosis of simple chronic Eustachian inflammation under careful management is excellent, great relief and occasionally cure resulting. In true aural sclerosis, however, the outlook is extremely grave; without treatment or climatic change, total loss of hearing seems the only alternative; and misdirected therapeutics, and preëminently meddlesome operative surgery, assures speedy and hopeless deafness. Fortunately, however, by the use of proper means, if the patient can be controlled, the disease can be arrested in most cases, and in some instances a slight degree of improvement secured.

A third type of Eustachian disease deserves special consideration. *Septic* tubal inflammation, the Eustachian lesion of purulent otitis, precedes and accompanies all cases of middle-ear suppuration, and may be found in examples of purulent rhinitis where the tympanum has as yet escaped infection. The cause is the entrance of pathogenic bacteria or their ptomaïnes into the ear-tube; it occurs, therefore, with all types of septic naso-pharyngitis, preëminently in scarlatina, typhoid, diphtheria, and measles.

The symptoms are usually marked and distressing, being those of simple acute inflammation much exaggerated; if the tympanum is invaded, agonizing pain, delirium, and even coma may ensue, the temperature frequently reaching 105°. On examination the post-nasal mucous membrane will be found intensely gorged, œdematous, and dark-purple in color; erosions extending to shallow ulcers, from the death and shedding of epithelia, are also characteristic lesions. The tubal opening is usually not visible, and patches of semi-adherent pus stick to the Eustachian prominences and the general mucous membrane. I have frequently seen glairy muco-pus oozing from the tube in an adherent string, illustrating the bad surgery of using Politzer's inflation—as usually employed—in these cases. Inspection by the external canal may show any phase of destructive otitis, and perforations of the drum are the rule.

The affection is always a serious one, always threatening both hearing and life; the first by invasion of the tympanum, the second by extension to the mastoid cells and the meninges. General septicæmia, with its dangers, is also far more common in cases of purulent otitis, the writer believes, than is taught in most otological works.

The treatment of Eustachian salpingitis varies widely, according to the variety and the stage of the disease. The simple acute type reacts exceedingly well to properly directed therapeutics. The indications are: first to control the coryza by means of cocaine muriate, delicate antiseptic and sedative spray applications, and the use of a sedative powder, containing bismuth, morphine, and atropine; or, as I frequently employ, a spray application of menthol, camphor, and eucalyptol, in minute proportions, dissolved in *albolene*, or a similar bland oil. In severe cases where discomfort is great, atropine and sodium bromide, given by the mouth, seem to exert a strong controlling influence. The pharynx should receive soothing treatment, and laryngeal or bronchial complications careful attention. Symptoms referable to the middle ear, unless pain is a prominent feature, are far less important, as they will disappear as soon as the salpingitis is controlled, and all meddlesome surgery directed to the drum membrane through the auditory canal is so unscientific and useless as, perhaps, to deserve the name of an anachronism—belonging as such procedures do to the dark ages of otology. Politzer's or catheter inflation may be called for in the later stages of the disease, and direct tubal applications by means of the *syringe-catheter* are indicated, should hyperæmia and hypersecretion persist.

If the inflammatory process tends to continue and become subacute in character, sprays of the distillate of hamamelis, properly diluted, or of the sulpho-carbolate or iodide of zinc, used preferably in the post-nasal atomizer, act very well. Patients can usually be dismissed cured in from one week to one month of treatment.

Croupous inflammation of the tubes and naso-pharynx demands the approved antiseptic treatment of diphtheria, but when the disease is so extensive is seldom successful; the urgency of the laryngeal and constitutional symptoms generally far outweighing and masking the aural sequelæ.

Chronic Eustachian catarrh was, up to a very recent date, one of the opprobria of the profession; the prognosis under the dallying, unscientific treatment in vogue a few years ago, as to relief, being *nil*. But at the present time, improvement can be promised to all but aged or hopelessly delicate patients, and a cure can be obtained in most early cases. The naso-laryngeal tract must first be brought as near a condition of normality as its lesions and the state of our knowledge permit. Especially must all nasal obstructions be removed, the great danger of even a moderate degree of stenosis having been incontrovertibly proved by Pomeroy[1] and others. Usually this can be accomplished by the use of well-chosen sprays, of chromic acid used by Bosworth's method, or by the very cautious and conservative employment of the galvano-cautery; in very rare cases only the septal knife, saw, or gouge, and the nasal snare may be needed. But (*physiologically*) free respiration through both nostrils is absolutely essential to permanent improvement.

The faradic current applied directly to the turbinated bodies, the Eustachian prominences and the pharynx, by means of the nasal electrode, and applications to the tubal lining by means of the syringe or ordinary catheter (only the mildest solutions in bland oil being admissible in the latter instance) are of great value. Of course, inflation, drum massage, and other of the well-known therapeutic methods must be directed to the tympanic membrane and chain of ossicles to secure improvement in hearing. Internally and constitutionally the bloodvessel tonics are of the first importance, and careful regulation of the habits of life is essential.

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[1] The Medical Record, February 18, 1888.

In cases of true sclerosis, applications of stimulants to the naso-pharynx and Eustachian passages are of far more value than is generally supposed; galanga, iodine, eucalyptus, thymol, and myrrh, are valuable in the order named, and the approved treatment of sclerotic rhinitis and pharyngitis must be carried out in fullest detail. Constitutional remedies are to be directed to the diathesis, and a large share of fresh air and exercise, accurately regulated, must, if possible, be secured. The methods advocated in earlier stages of the disease should be carefully carried out, often over periods of a year or more, and the patient must remain under permanent supervision.

The procedures through the outer canal, at the command of modern aurists, are almost too numerous to mention; but very many highly-lauded operations are, in the writer's opinion, not of permanent benefit, but of inevitable injury. An invariable rule should be that no fresh migration of leucocytes should be caused—their tendency to form fresh connective tissue being the pathological essential of the disease. The *rationale* of scientific treatment is to so "stimulate" the blood and nerve-supply as to prevent the hyperplasia and contraction of connective tissue elements, and to control inflammation and the migration of fibro-blasts.

Two operations are at the present time very fashionable in aural sclerosis: *mobilization of the stapes*, lately brought forward as new,[1] but frequently performed, lectured upon, and reported[2] by me more than three years ago under the name of *drum-stretching*, and considered on theoretical and anatomical grounds years before by Kessel and Politzer, is perhaps the most valuable practical operation in these cases. But its effects last but a few months at most, and it cannot yet be decided whether, from its frequent repetition, the patient receives permanent benefit or the reverse. Done with extreme care there is no inflammatory reaction, and but trifling risk; the operation consists in making a free incision in the posterior segment of the drum; a hoe-like instrument of great delicacy is then introduced through the cut, and cautious traction made on the handle of the malleus, or the incudo-stapedial joint, or both, so "stretching" and possibly breaking up adhesions. In nearly all cases there is at least temporary improvement in hearing, and—*as is the case with almost every operation upon the ear (as upon epileptics)* temporary "cure" of the tinnitus aurium.

The second fashionable operation, recently brought into much prominence, but not new, is *excision of the drum-head* with the malleus and [*occasionally*] the incus; the procedure is naturally a far grosser one than stretching, and exceedingly liable to be followed by reactive inflammation. This operation, possibly of great value in purulent attic disease with necrosis of the ossicles, the writer cannot consider rational in cases of aural sclerosis, for the following reasons:

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[1] Annales des Maladies de l'Oreille, November, 1889.

[2] The Polyclinic, September, 1887, p. 89.

1. The operation always causes fresh migration of small cells, whose persistent tendency is to organization with subsequent contraction, equalling increase in deafness.

2. The method (in many cases) permanently robs the delicate tympanum of its protective covering, the drum, and all aurists are aware that the results of a persistent perforation are cirrhosis and impairment of audition: the primary physiological purpose of the membrana tympani being protective, any permanent opening is harmful to the ultimate condition of the organ. As so ably shown by Richey, of Washington,[1] "The tendency of the membrane to heal is an effort on the part of Nature to preserve the function of hearing from the effects of disease, or ill-advised surgical interference."

3. The manipulation is always painful, requiring general anæsthesia, and always has an element of danger—actually resulting in not a few instances—viz., acute purulent otitis, with its perils to hearing.

To summarize briefly, it may be said that the operation of excision—of admitted value in some cases of necrosis—offers not a single advantage over that of mobilization in aural sclerosis, but is, on the contrary, dangerous. Politzer's section of the posterior fold of the membrana tympani will often secure (and has done so in my hands) all the results in diminishing tension and tinnitus which have been reported as resulting from excision, and has the immense advantage of being safe, and almost without proneness to set up acute changes. Yet its distinguished inventor does not claim that the results are permanent.

The technique upon which I have most relied during the last three years for the control of distressing tinnitus after routine measures have failed, consists in *freezing the mastoid region* over the branches of the posterior auricular and stylo-mastoid arteries by means of a rhigolene or ether spray. The skin is frozen white over the entire mastoid area—of course with proper caution—at intervals of from one to six weeks, for an indefinite period; the results being almost invariably good, and "cure" of the tinnitus in a certain proportion of cases. The method was publicly used and lectured upon by me to the Polyclinic class in the fall of 1887, and has since been used continuously with increasing confidence. The exact explanation of the result is somewhat doubtful; the well-known vasomotor effect of freezing methods are, however, well known, and it is doubtless by means of the nerve influence, acting through the stylo-mastoid artery—which supplies the tympanum, mastoid cells, and semi-circular canals—that the method acts favorably. It is also well known that surface freezing lessens the conductibility of nerves, and profoundly affects nerve centres.[1]

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[1] Transactions American Otological Society, 1880.

The therapeutic management of purulent Eustachian salpingitis does not differ widely from that proper in cases of simple acute catarrhal inflammation, but the spray selected should be decidedly antiseptic, as well as sedative, in character, and the drum and middle ear demand the most thorough attention and treatment. Inflation should not be used unless the lower portion of the tube can be first cleared, and injections of fluids into the tympanum through the Eustachian passages have been found to be rarely valuable. Tonics are always called for, and complications will need special attention. Thorough treatment of the naso-larynx, antiseptic irrigation through the external canal, and the proper use of boric-acid powders, will cure all cases where neither a profound cachexia nor dead bone exists, the latter being causative of the luxuriant growth of granulation tissue so troublesome in many cases of this type.

In conclusion, it has been the experience of all aurists that in no region of the body are meddlesome therapeutics so ill borne as by the Eustachian tubes, and all methods must be carried out with the most cautious, painstaking conservatism, to insure good results, in all phases of Eustachian salpingitis.

49 N. SEVENTEENTH STREET.

HÆMO-HYDRO-NEPHROSIS, DUE TO A SLIGHT INJURY; DRAINAGE; RECOVERY.

By GILBERT BARLING, B.S., F.R.C.S.,
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R. W., aged fifty-four, came under my care at the General Hospital, April 27, 1889, with a large tumor occupying the front of the abdomen, on the right side. It extended upward nearly to the costal arch, downward to the brim of the pelvis, and nearly to the middle line, but did not present at all distinctly in the lumbar region. Palpation gave the impression of a very tense cyst; there was no resonance over the front of it, such as usually exists in renal tumors. The skin and subcutaneous tissues moved freely over the tumor, but the muscles were tightly stretched over it, giving the impression that the swelling might be intra-muscular. His *history* was as follows: About two years before admission the patient's wife, when getting into bed, slipped, and knelt on his right side with some force, causing very severe pain for a short time. Six months ago he noticed a swelling on this situation as large as an orange. This slowly increased in size until the last few weeks, during which time the increase in size has been rapid. The patient, formerly a fat man, has lately lost flesh rapidly.

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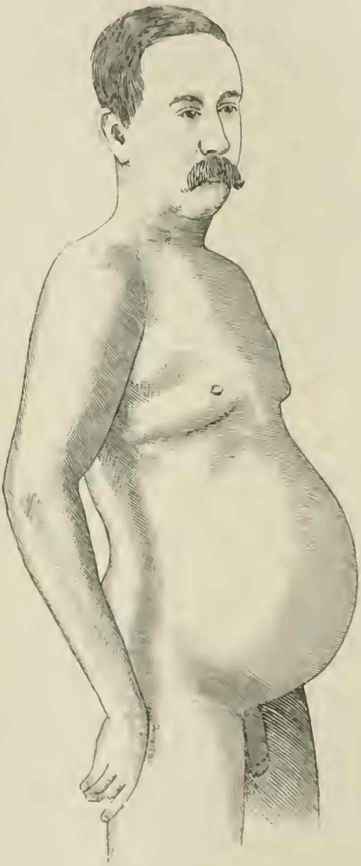
[1] See Dr. S. Weir Mitchell, in Medical News, September 3, 1887.

Puncture with a hypodermic needle drew off brown-colored fluid, which contained blood-corpuscles, large granular or exudation corpuscles, and cholesterin.

The urine for twenty-four hours was forty-three ounces, specific gravity 1020, acid, without deposit, and free from albumin and sugar.



April 30. An incision four inches long was made over the most prominent part of the tumor, and on opening the abdomen a dense, white capsule presented itself, showing, over an area as large as a crown-piece, a staining with blood round the needle-puncture. The hand passed into the abdomen failed to find any intestine in front of the cyst, the limits of which, easily determined from the liver above, could not be defined in other directions, though the wide base evidently occupied the region of the kidney. A large trocar emptied seventy-two ounces of cocoa-like fluid with a slight urinous odor, and containing a large quantity of cholesterin. Subsequent examination showed that this fluid contained 5 per cent. of urea. An incision was then made through the very dense wall of the cyst, which was fully one-third of an inch thick, and the cyst edge was stitched to the abdominal wall, a glass drain being inserted. Before this was done about another twenty ounces of fluid escaped, containing bits of dark-brown material, the size of marbles, evidently old blood-clot, and a layer of this material lined the inside of the cavity.

For the first few days all went well, the cyst being carefully irrigated twice a day, whilst there was a fresh discharge, evidently consisting partly of urine, with pieces of old blood-clot. The discharge then became very putrid, the temperature was considerably elevated at night, the patient got much thinner, there were profuse sweatings, and the urine passed by the urethra diminished in quantity until it fell to as low as sixteen ounces, with only 0.75 per cent. of urea, and it was constantly alkaline. The cyst was at the same time steadily shrinking, and as I could not but feel that nephrectomy under these conditions would pretty certainly prove fatal, I refrained from further operation. By the beginning of July matters had begun to mend; the temperature was practically normal, the urine rose to between twenty and thirty ounces, with increase in the amount of urea, and its reaction was acid, whilst the discharge, which was less offensive, diminished considerably.

October 30. The patient left the hospital, with a sinus still discharging, but otherwise well. The urine passed was fifty to sixty ounces in twenty-four hours, specific gravity 1014 to 1020, acid, and with no abnormal constituent.

He has now been at work several months, is looking well, and has regained the weight he lost. From the sinus there is a small amount of purulent discharge, smelling of urine, but it does not amount to more than a few drachms in the twenty-four hours, and is but a slight inconvenience.

I have placed before the patient the alternative to his present condition, viz: nephrectomy, but he is so well able to do his work and to get about that he declines to have any further operation done at present.

My explanation of the origin of the cyst is as follows: The injury referred to lacerated the kidney-substance, the split running into the pelvis, and, as no blood was seen in the urine, the ureter was probably plugged with clot. Hæmorrhage then, with retained urine, distended the pelvis of the kidney, and in all probability caused atrophy of the kidney-substance to a considerable degree. After the operation, when the cyst was suppurating profusely, the urine passed from the bladder became ammoniacal, and contained phosphates and bacteria, so there was probably a communication reëstablished between the remnant of the kidney-substance and the bladder, though it is doubtful if that still exists, as the urine is and has been for a long time acid, and free from phosphates, etc., whilst there is still a purulent discharge from the sinus.

THE SELECTION OF CASES OF INSANITY FOR DIFFERENT METHODS OF PRIVATE CARE.

By Henry R. Stedman, M.D.,
of Boston.

The time-honored warning against delay in removing a patient who is insane to an institution for that class—based, as it is, on the most conclusive evidence as to the great preponderance of recoveries in cases of early admission—is still needed, although statistics show much improvement in this respect of late years. This advice, however, applies with much less force to the well-to-do than to the poor; but owing to the fact that early commitment to a public asylum is highly advantageous to the poor—for whom home or private care is, as a rule, impracticable if not impossible—and as the dependent class comprises, of course, the bulk of the insane, this custom has come to be looked upon by many as indicative of early asylum care for all classes—to the exclusion of non-institutional methods which, when properly selected, are attended with equally good results. The injunction should be, therefore, to place the patient as early as possible under treatment suited to the individual case, whether in an asylum or outside its walls.

The numerous requirements for satisfactory treatment and care of the insane, especially the private class, call for a variety of methods; but these are necessary and obtainable without as well as within the asylum. The former are of the natural, private and domestic order suited to the wants of the individual; the latter of a more artificial, public and official nature indispensable to the organized care of a large number. Each of these forms of care has its advantages, although the hospital for the insane, with its varied means of treatment, its safety, skilled attendance, regular exercise and mode of living, the administration of medicines and regulation of diet, has a great advantage over private care and treatment of the mass of the incurable, and a large proportion of the presumably curable, insane. It is almost unnecessary to say that there are more insane patients cared for at home, who from their lack of means would be benefited by asylum care, than there are inmates of asylums who would have been better situated under other surroundings. Still, we should recognize the fact that each kind of care has, besides its appropriate cases, certain unsuitable ones which should be in the other class, and that achievements in hospital construction, appliances and methods generally, and the advances thereby made in alleviating insanity, have attracted attention away from the *modicum* of good that is to be found in other surroundings.

Moreover, it is by no means an easy matter to strike the correct balance between the patient's well-being, physical and mental, and his happiness.

The former he may receive in a hospital, and it would often be a mistake to advise any other course; but there are many cases of the more appreciative class for whom outside care, though more difficult, is more comfortable, as conducive to happiness from more congenial surroundings.

Although we may not all be willing to follow Maudsley to the extent of accepting his dictum "that all the comforts which an insane person has in his captivity are but a miserable compensation for his entire loss of liberty—that they are petty things which weigh not at all against the nightly suffering of a life-long imprisonment," we should do well to keep in mind the necessity for the fullest freedom that is compatible with the welfare of the insane person, and the fact that to quiet and regularity of life may often be added the enjoyment of a comparatively domestic environment without detriment to the patient's condition or the safety of others.

But by far the most potent reason why the physician should be acquainted with the various expedients for caring for the insane person privately, is the injury to the patient's future career from the unjust and often absurd popular prejudice about hospitals for the insane. If a patient can be treated out of an institution and recover, it is better for the physician and for him. Often no alternative is left us than to cast about for the next best place for one for whom asylum care would be far preferable, but whose dread of an asylum life is as unconquerable as it is unreasonable. It is an axiom, also, that, given the means and knowledge of proper treatment, one cannot receive the same personal care when he is one of a large number as when treated alone, or with but few others, although there are certain insane patients whose self-feeling is so great that they are better off for finding that they do not receive more attention than others around them.

Again, the presence of a large number of insane people exerts, in many cases, a depressing influence which may be a serious drawback to improvement, not to mention social and other differences, which would keep them apart if they were well. While there are recovered patients who recall with the greatest pleasure their asylum experience, there are many more who fear a second attack chiefly because it means a return to a place that they only think of with dread. This is often true to some extent of any surroundings in which they may have been treated, but in the various gradation of methods from asylum to home care, I think the feeling is less strong as we reach the latter.

Private care and treatment may be had—

1. In travel.
2. At home.
3. In specially provided private quarters (single care).
4. At small private establishments for mental disorders.

To select appropriate cases for these different methods, without including those for whom the asylum is best adapted, is no easy matter, for no rules can be laid down, patients are so variously disordered in mind and so variously circumstanced. Consequently, only general suggestions are offered, which in many instances may require modification to meet the special circumstances of individual cases.

It is very largely a question of means whether a patient should be treated in either of the ways indicated or at an asylum. The more violent, difficult and prolonged the case, the greater the expense. The worst cases can be cared for in special private quarters with a sufficient number of nurses and frequent medical visitation—although even the continuously disturbed incurable cases and the desperately homicidal, suicidal or self-mutilating can never be managed privately with anything like the efficiency of a well-conducted asylum, with all its resources in the way of modern principles of treatment and arrangements adapted to the requirements of the present time. For, the moderately wealthy, the acute curable cases, and certain of the chronic class to be specified later, may properly receive private care, and a fair proportion of them at home, under proper supervision and nursing. Cases of the remaining forms of insanity in this station of life should, broadly speaking, have asylum care. If the patient be poor, the cases are rare that can with safety or benefit be kept from a hospital for the insane.[1]

But first, as to travel. This should be prescribed for cases that can hardly be called insane, as they are mainly on the threshold of mental disturbance. It is rare that the continued diversion and exercise attendant upon travel is of use when the disease has become pronounced (when actual delusions have set in), even though they occur early in the disorder. The most carefully selected early cases are benefited by travel, because brain-rest is usually the indication from the start rather than diversion and change.

I have known more than one melancholiac for whom travel had been tried at this stage who became bewildered by the frequent change of scene; irritated at having to meet people when they wished to avoid them, and were worse for the change. One patient, in addition to her other false beliefs, contracted the delusion that she was being taken about to different places to be exhibited. It is very hazardous, also, to advise travel for a patient in whom there is even a suspicion of suicidal intent, as it is impossible for the most careful to be watchful enough upon a journey.

Suitable cases for travel are for the most part those who are simply depressed, have been suffering from insomnia, who perhaps lack their former energy and interest in life generally, to whom petty annoyances have assumed the guise of great troubles, whose affection for their family is lessened, and who are in a lowered physical condition.

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[1] But even among the poor we meet exceptional cases where the delay of a week in proposed removal to the asylum has been attended with sufficient improvement to warrant the hope of a speedy recovery. Such instances, however, are only mentioned to emphasize what is possible in the way of home life for the insane, and to show that they sometimes do well *in spite of* their surroundings.

For such, travelling—preferably by land—is often beneficial. The object is to take the patient away from the painful subjects of thought about him at home, to awaken his interest, and to substitute new and pleasant ideas for morbid and distorted ones. A companion is essential. This is not a superfluous caution. Depressed patients will sometimes beg to be allowed to go away alone, as did a gentleman who came under my observation recently, and who, for want of proper insistence on the part of his advisers, actually crossed the ocean alone, but was so wretched that he fortunately returned on the next steamer. The companion should be cheery, tactful, and alert. A friend is better, as a rule, than a relative, who will be apt to let the patient have his own way too much. A young physician may be of great service. In the more anxious cases an intelligent nurse, if it can be managed, will help greatly. Travelling should be done by day to secure sufficient night rest. Fatigue should be avoided, it being better to remain in a few places of interest than to travel about and change the scene too frequently. Often a higher latitude than that in which the patient lives proves a tonic, while a southern climate is found too relaxing and depressing. Long sea voyages rarely prove useful: in most cases within my knowledge these have been failures, and Blandford finds that there is something about the seaside which tends to convert the preliminary stage of confusion and depression into wild excitement, and prefers for this reason to send patients for change to an inland place. Convalescing cases are particularly susceptible to the advantages of travel, and often gain faster in this way than in any other change. Another class who are especially benefited by slow travel or change to a country life, with plenty of fresh air, are mild cases of mental disturbance, due simply to the exhaustion of fever—post-febrile insanity.

Next, as to home care and treatment. Everyone knows that there are a large number of insane persons living at home, some comfortably situated, some among tolerable surroundings, and others wretchedly cared for. We also know of not a few patients who recover at home quite as quickly and thoroughly as do asylum cases. What is the character of these cases who do well at home, and how can we prevent their haphazard disposal, some at home and some in confinement? Which are the neglected cases that need asylum care?

If some very general laws can be indicated and followed as to the selection of cases, more would enjoy the liberty and comfort of home who should have it, and others the skilled treatment of a well-equipped hospital for the insane. As a step in this direction the form of insanity must be considered, as well as the make-up of the patient's family, his attitude toward them, and the character of his surroundings generally.

But whatever the form of the malady or situation of the patient, it is often the amount and kind of attention the physician gives to the case that will ultimately determine between home and the asylum for the patient, and perhaps between recovery and confirmed insanity. This is not platitude. There is little doubt that more cases would do well at home if they were as carefully and regularly observed as are cases of physical disease. It is not enough to study an apparently mild case of melancholia occasionally and at long intervals; to have him come to the office, or to inquire of the family how he is getting along. It is a lack of attention to details, of close inquiry into the patient's line of thought, both from him and the members of his family, to ascertain the progress of the disease, that has made more than one case turn out disastrously. The fear of suggesting suicide to melancholic patients by inquiries in that direction I am convinced is exaggerated. I have never known it to occur, but on the other hand, the instances when occasional unobtrusive but minute inquiry of the patient and family as to this particular has been avoided, and disaster has come, may well make us consider whether one's whole duty is done when this precaution is not taken. The neglect of attention to the details of the patient's requirements has led to the disrepute into which home treatment of proper cases of insanity has fallen, quite as much as the attempt to treat unsuitable cases in that way. Home treatment for curable cases seems to me to bear to that of ordinary disease the same relation as does the capital operation and the after conduct of the case. It requires much time, constant watchfulness, attention to a variety of minor details and the summoning of special skill in emergencies. Before counselling home treatment, the feeling of the patient toward the members of his family is an important matter. If he has strong and increasing antipathies toward one or more of them, and dangerous delusions about them are persistent and uppermost in his mind, or if suicidal thoughts and attempts are prominent manifestations, little is to be gained and much valuable time may be lost in delaying his removal from home, unless the physician is prepared to convert the house into a hospital on the presumption that the case is a curable one. Often, however, the home feeling remains strong, as is shown at more rational intervals, and at no time is alienation from those dear to him appreciable. To such patients it is an immense satisfaction to have their friends at hand. Moreover, the influence of a relative in calming a patient can often be exercised by no other. Cases marked by great anxiety in which ordinary petty annoyances are so magnified as to weigh down and distress a patient are better for a change from home. The effect of the patient upon the family, also, is important. If he keeps the household in turmoil and wears upon his relatives so as to affect their health and spirits by the constant attention he requires, or unnecessarily exacts, home is not the place for him. It is sometimes best, if the patient remains at home, to send away any children there may be in the family, as they are an especial source of anxiety and unnecessary worry, particularly to a mother, because of their unthinking demands or because she imagines they are being neglected, and sometimes because there is danger to them from the mother's homicidal tendencies.

Melancholia, of all the forms of insanity, is oftenest treated at home, because cases of this variety are vastly more numerous than those of any other, because its manifestations are usually far less pronounced and less difficult to deal with, and because it is especially frequent in a mild form. There are quiet cases simply depressed, who for a long time are able to live in the family without harm, who perhaps have tried travelling and change of scene unsuccessfully. Their life can be regulated and made much more comfortable by the physician with intelligent help from the relatives, and nursing or companionship. But the mildness of an attack of melancholia is by no means incompatible with unexpected suicidal and other impulsive outbreaks, and here is applicable the attention to details a dvised above.

Besides close inquiry as to the possibility of suicidal ideas, the patient's heredity should be investigated. It is an established fact that this propensity is highly hereditary and colors the insanity of descendants in the large majority of cases. Melancholia without delusions is a fertile soil for such tendencies. I recall a patient in a large asylum who made repeated sudden and desperate attempts at self-destruction, who in the intervals was sociable and agreeable, though with a tinge of sadness, and appeared otherwise entirely rational, having no delusions whatever. In her case the family history was very bad as to suicide, but was ignored by her relatives when she became depressed until she suddenly attempted to hang herself, and nearly succeeded, when she was committed to an asylum, where it proved to be a marked suicidal impulse.

Other quiet patients are the *acute dements*, young people who usually make good recoveries. Their state of inertness—stupor—renders them good subjects for home care. They require to be dealt with in many cases like babies, as they cannot be roused to make the slightest exertion. Often it is only a matter of nursing. Here it is necessary to guard against injury by the struggles of certain of this class who resist doggedly all attempts of any sort to help them, as well as the sudden and most unlooked-for outbreaks which sometimes occur.

As to disturbed *violent cases of the acute, curable class*, there are more, especially among those in good circumstances, who should have the benefit of home treatment than is now the case. I fully accept Folsom's belief, who reports several instructive cases of this kind successfully treated by him at their homes, in support of his opinion that many cases at least of mental disease are to be treated precisely like typhoid fever or rheumatism, or a broken leg, so far as removal from home is concerned, and that home associations are no more harmful in properly selected cases than in pneumonia or phthisis. When this course is adopted, the home must be converted into a hospital, and the case conducted methodically with the aid of nurses, or, in exceptional cases, members of the family. The patient should have apartments entirely separate from the rest of the family, especially arranged to meet the emergencies and other requirements of his attack.

In *insanity connected with the puerperal state*, when acute and recent, special exertion and sacrifice should be made to treat the patient outside of the asylum, not only to avoid the stigma of residence there, but because these are highly favorable cases for recovery and are usually of short duration. This applies to difficult, violent patients, as well as to the puerperal melancholiacs, the majority of whom are mild, easily-treated, transient cases. A special precaution is to remove the child from the mother in most cases as soon as possible and to watch her closely. Attempts to destroy the child are specially frequent and suicidal tendencies a common manifestation. The rare cases of insanity of pregnancy should unquestionably be kept at home, at least until after labor, to avoid the sad fate for the child of being born in an asylum.

Of chronic cases *senile insanity and dementia* is by far the best adapted for outside treatment and care. It is only the worst patients one sees at the asylum, while subjects of the milder states of senility in which there is decided mental complication are a numerous class and apt to be provided for at home. Old people, even when insane and regardless of their condition or surroundings, are often disastrously affected by a complete change from home. In consequence of their extreme age they are no longer receptive of new ideas or adaptable to a new environment. The same advice applies to the allied state of mental impairment following hemiplegia and similar attacks following destructive cerebral lesions.

The mass of cases of *insanity of doubt*, are cared for at home. Most of these are on a par with mild delusional patients, who rarely show except to their nearest friends their mental weakness. Very much may be done by the physician in the way of advice, assurance, encouragement, and consequent help to those doubting, but otherwise most intelligent patients, by keeping track of them, and methodically visiting them. Change of abode is often considerable help in these cases. It is only when their doubts become terrible fears that they have made, or will make, fatal mistakes, will contaminate others by their touch, etc., which lead them to take absurd precautions, which withdraw them from others, and interfere continually with their comfort and health—in short, put them entirely out of harmony with their surroundings, that removal from home becomes urgent.

Chronic degenerative insanity is not often suitable for care outside the asylum, except during the initial stages, while the patient is comparatively appreciative. With the advent of delusions of suspicion comes often more or less violence, noise, self-neglect, refusal of food, destructiveness, perhaps—conditions which cannot be properly met by ordinary means.

There are certain classes of cases the treatment of which is often improperly tried at home. I refer to *hysterical insanity and dipsomania.* The former rarely improve until they come under systematic control and judicious neglect—unless years are consumed in the process—whereas asylum care and discipline will sometimes give young women so afflicted a wonderful and speedy start in health and control.

Cases of dipsomania, although not properly coming into the category of insanity, are surpassed in difficulty of management by few of the actually insane, and in far-reaching effect of the malady upon the patient and his family: 1. Because of the length of time before their condition is realized, and the credulity of the family in the victim's promises of reform, and particularly by the fond mother's natural trust and long-sufferance of the son's disgraceful life, which fatally delays proper treatment. 2. The absence of proper provision for such cases in the shape of a closed asylum exclusively for that class, under a board of disinterested trustees and State control. 3. The difficulty of keeping them in a lunatic asylum when once committed thence, owing to their cunning, the dislike of the medical officers for that class of cases, who are a disturbing and otherwise trying element, and the importunities of the patient, and his relatives sometimes, before he has become sober. Advice of great value is not to be had concerning these patients under these circumstances. All that I can say is, that a State lunatic asylum to which the patient is legally committed, as is the case in Massachusetts, is after all by far the best place for him; that the friends should be discouraged as long as possible from removing him, and the superintendent begged, as often as we can decently do so, to keep him there. Small private asylums, particularly where there are insane inmates, are unsuitable places, and but temporary makeshifts, for the inebriate class.

The separate care of *acute cases of insanity* in a house or villa hired for the purpose—what is called single care—is practised but little in this country. In England it is more in vogue, and looked upon as specially valuable. The treatment should be undertaken in a house belonging to a physician, or in a private house taken by the friends for the purpose. It is essential that the attendants should be under immediate control and supervision of the physician to whose hands the patient's care is entrusted. It is perfectly easy to manage matters for excitable and even noisy and violent patients, if the house be in a quiet neighborhood, and with the advantage of perfect privacy. This method is practically the same as that of turning the house into a hospital, except that the latter course is best adapted to a milder class of acute cases.

The small private establishment for nervous and insane cases stands as a means of care between the home and the large asylums. Many patients whose surroundings in a variety of ways are unsuitable for the separate hospital-at-home care, the milder acute, and presumably curable cases of mania and melancholia, are best treated in this way. The patient's family, for example, is scattered, and no single member is ready to bear the anxiety and be responsible for the patient's care at home, and its expense. The case may be of too severe a type for home management without greater sacrifice than the family is willing to make, and they shrink from sending him to a large asylum. The patient has possibly been living at home until he has grown too difficult to have in the family, who have been tried to the utmost. The anxiety and care may be telling upon the health of the husband or wife. Beside recent cases there are varieties of the chronic class of insanity, the subjects of which can be made very comfortable in this way. Examples of suitable cases are the man or woman with fair intelligence, but deficient self-control, whose mind is weakened (congenitally, or by an attack of insanity), for whom family life has proved unsuccessful, owing to bad tendencies and mistaken indulgence; the case of doubting insanity which has gradually grown to dread everything, and by whom no authority that can be exercised at home is respected. Hysterical and neurasthenic cases, of a severe type, are often most amenable, when thus situated away from too sympathetic friends, and under control amid fairly congenial surroundings. The demented general paralytic can be treated at a well-conducted home-hospital of this character, where separation of uncongenial patients is available, at considerable saving of family worry, mortification and expense. The life of the chronic melancholiac, so situated, can also be made fairly bright; many border-land cases, also, for whom domestic life has proven a failure, are especially susceptible to guidance and control, when exercised among such conditions in a semi-domestic environment. Such establishments thrive largely on a public dread of asylum-care for a relative, as well as upon the greater privacy to be secured by the method. For the same reasons, patients are often sent from home to irresponsible people for care, who are subject to no supervision themselves, and seek for no medical advice for the patients under their charge. Without a resident physician, none of the classes mentioned can be properly treated in a home devoted to the care of the insane, and expert supervision, capable nurses, companions or attendants to meet the requirements of widely different cases, as well as regular inspection by State medical officials, are essential for the best results. The public, or large private asylums, are subject to public scrutiny, and have supervisory boards, which divide to some extent the responsibility of the patient's care with the medical head of the institution. Consequently, although, largely, each is what its superintendent makes it, and each has its individual merits, a good and fairly uniform standard of care is reached by all. But the smaller private hospital is conducted largely according to the individual ideas of the physician in charge, so that the standard of care varies greatly in different places, and greater pains must be taken to ascertain how the establishment to which a patient is to be sent is conducted, and only that having the essentials of the most appropriate methods should be selected.

The situation of the patient's future abode is always a matter of importance. Some do better whose friends live near at hand, and can visit them often. Others, for whom visits have proved inadvisable, are constantly unsettled by the thought that their family is within easy reach but that they cannot go to them. Consequently, a distant residence is preferable. The disposal of the patient varies also according to the stage of the disorder in other ways than those mentioned. Just as there are patients who should enjoy family life, during such a time, in the initial stages, as they are appreciative and not unsettled, but for whom too long delay in commitment to an asylum is dangerous, so there are others who require asylum care and no other at the outset, but who should have a trial at home later, the opportune moment for which should be seized without delay. This includes many in the early stage of convalescence (for whom travel is not advisable) when the home can be properly arranged for their reception, as it may often be well to avoid too great a strain by the change involved in a complete resumption of family life and duties at once. Emergence from an attack of insanity to the unfamiliar surroundings of an institution, although rarely actually disastrous, should be prevented if possible. As to the chronic insane in asylums, the more I see of them the more I am impressed with the good effects of change in individual cases. Of course, the proportion to be safely removed from the asylum is small, and of these but a small number will remain away long if not kept under a physician's observation. Still, there is room for improvement in the way of trial outside of the asylum. Even when it does not succeed, the satisfaction of giving the patient another chance before dooming him for life to separation from the world is great, and the effect such a step has in gaining and keeping the confidence of the patient is a great help to all concerned.[1] The experience gained in boarding out in private dwellings the chronic harmless insane taken from asylums in this and other countries, indicates the possibilities in this direction.

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[1] For further advice on this point, a recent article by Schüle on the "Value of Early Discharges from Asylums," is useful. (Report of the annual meeting of German alienists at Berlin, September 17 and 18, 1888.)

A great deal might be written upon the details of treatment peculiar to the kinds of care here considered, but it only remains to be said that modern asylums, under progressive management, by introducing new styles of buildings and arrangements looking to the greater segregation of the insane, are doing much to fill the want of natural domestic surroundings.

THE MALARIAL ELEMENT IN OÖPHORALGIA.

By H. C. Coe, M.D.,
OF NEW YORK.

The terms "oöphoralgia" and its hybrid synonym "ovaralgia," have been used somewhat vaguely to describe pain in the region of the ovary which does not seem to be due to actual disease of that organ. Olshausen is the only writer on diseases of the ovaries who devotes a separate chapter to oöphoralgia, which, with Charcot, he seems to regard as a hystero-neurosis. Now, I know no reason why we should not regard certain pains in the ovarian region as purely neuralgic in their character, even though they may be primarily due to disease in or around the ovary which is not appreciable clinically. The question of the anatomical cause of ovarian pain I have discussed at length in a paper in Wood's *Reference Handbook;* it is sufficient to state that I believe it to be more frequently of extra- than of intra-ovarian origin, *i. e.*, it is due rather to the inclusion of nerves in perimetric adhesions than to the pressure upon terminal filaments by cicatricial tissue within the diseased gland, as is shown clinically by the relief afforded by separating such adhesions without removing the affected ovary. The subject of ovarian pain, whether menstrual or inter-menstrual, assumes no little importance from its bearing upon abdominal section, though happily it is now, *per se*, seldom regarded as a sufficient indication for laparotomy. Contributions to the palliative treatment of ovarian troubles should always be welcomed, and this is my excuse for presenting the following case:

Mrs. M., aged twenty years, was first seen by me four years ago, soon after she had had an abortion at six weeks. She was suffering with severe pain in the right ovarian region, unaccompanied by evidences of acute inflammatory trouble. Examination showed well-marked anteflexion, with prolapse of the right ovary, the gland being neither much enlarged nor especially tender. Her husband, himself a physician, treated her locally, and she was soon up and about. She had had moderate dysmenorrhœa before marriage, which continued afterward, but was relieved by dilating the os internum just before the flow. Two years later she became pregnant again, and I delivered her by high forceps without local injury, except a slight laceration of the cervix. Her convalescence was normal. The prolapsed ovary gave her some trouble during her pregnancy, but was not tender when I examined her three weeks after labor, and introduced a pessary in order to correct a tendency to retro-displacement and prolapsus. I treated her several times for the ovarian tenderness, but after a few months the pessary was removed, and she menstruated without pain, provided that the os internum was dilated, as before, previous to the flow, for the anteflexion persisted. Eight weeks ago I was called to see her. She had been in excellent health for several months, menstruating regularly and without pain. Her monthly flow had begun the day before, and was followed by severe lancinating pains in the right ovarian region, which radiated down the back of the thigh and across to the opposite groin. The patient is more than usually courageous, and certainly did not exaggerate her symptoms. She possessed a marked tolerance for analgesics, and was given large doses of morphine, antipyrine, and antifebrin, with only temporary relief. On palpating the abdomen I found extreme tenderness over the right ovary, while by the vaginal touch the organ could be felt distinctly enlarged and very sensitive. No rise of temperature or acceleration of the pulse. Diagnosis: Congestion of the ovary, the cause being unknown.

I advised hot applications over lower portion of abdomen, hot vaginal douches, and phenacetin, ten grains, to be repeated in an hour. No relief was obtained, and it was necessary to give Majendie ♏xx during the night, to render the pain bearable. Next day the mild galvanic current was employed, one sponge being placed over the sacrum, the other over the right ovarian region; it increased the pain, and was discontinued. As menstruation had ceased, glycerin tampons were used with the idea of supporting the enlarged ovary. They afforded only temporary relief. The patient at this stage became very much discouraged, and began to wonder if oöphorectomy would not be necessary.

After three or four days of ineffectual treatment, I noticed that the pain seemed to be most severe in the afternoon, that it reached its acme during the night, and gradually subsided during the morning hours. Careful inquiry developed the fact that the patient had had a well-marked attack of intermittent fever of the quotidian type a few months before, which yielded to twenty-grain doses of quinine in two or three days. The chill occurred in the afternoon. There had been no history of malarial neuralgia since then, but, noting the apparent periodicity and neuralgic character of the ovarian pain, I determined to test the value of quinine. On the following day twenty grains were given in the forenoon; the pain was much less severe, so that the patient was able to sleep without an anodyne. A repetition of the dose on the next day resulted in a complete disappearance of the usual sharp, lancinating pain, only a soreness remaining at its former site. On the third day the dose of quinine was reduced to fifteen grains, and on the following day to ten, which was given daily for a week. *The pain did not reappear.* The patient came to my office at the end of ten days, and reported herself as feeling well, and able to walk half a mile without pain or weariness. Local treatment (tampons and galvanism, with hot douches) was employed for a few days and was then discontinued. The next menstrual period was unattended by pain in the ovarian region. At the time of writing the patient is feeling as well as ever.

A somewhat extended search through the literature has failed to reveal a similar case of ovarian neuralgia which showed such an evident paludic origin, and yielded so promptly to pure anti-periodic treatment. In all other treatment in which quinine was employed it was given in small doses (two or three grains), combined with morphine, aconite, or muriate of ammonia, and there was no malarial history. While the paroxysms of pain in the case reported were, doubtless, at the outset due to ovarian congestion, it does not militate against the fact that they showed a marked periodicity in their onsets. The fact that they were absent at the succeeding period is, in my opinion, a proof that the malarial poison had been overcome by the thorough course of quinine. It might be attributed solely to the effect of the local treatment during the intermenstrual period, were it not for the fact that the patient had been under similar treatment before, and had felt perfectly well up to the time of her attack of dysmenorrhœa.

It seems to me that we are justified in regarding this case as one of malarial neuralgia affecting the nerves in and around the ovary, and comparable with similar neuralgia of the trifacial, except that here the pain was undoubtedly due to actual organic disease; but it assumed a periodical character through malarial influence, and was controlled by quinine.

THREE HUNDRED CASES OF INTUBATION OF THE LARYNX FOR DIPHTHERITIC CROUP.

By Dillon Brown, M.D.,
of New York.

In the following pages it will be my aim to present an accurate report and analysis of the croup cases which have been seen by me since my last paper[1] was prepared.

This report includes the results not only of the cases which were operated upon, but of every case of laryngeal diphtheria which came under my care during this period of time.[2]

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[1] New York Medical Journal, March 9, 1889.

[2] In the thirty-three cases of recovery, the names of the attending physicians by whose courtesy I was enabled to operate are: Drs. C. W. Bohmfalk, H. G. Lyttle, G. V. Hann, J. Lewis Smith, J. Lewis Smith, Jr., J. A. Roth, D. H. Stewart, G. C. H. Meier, G. D. Spor, J. R. Cypert, S. S. Jones, T. B. Columbia, Beverley Robinson, W. H. Lyons, Leo Schnepp, M. M. Dunton, A. Y. Reid, D. F. King, G. F. Morris, B. G. Strong, DeWitt Hitchcock, J. H. Lurie, and J. Henry Fruitnight.

SUMMARY.—Each case occurred in the practice of other physicians, through whose courtesy I was called in consultation. Sex: Males 48, of whom 18 recovered; females 52, of whom 15 recovered. Total, 100 cases, with 33 recoveries. Of these cases 65 were treated with full doses of the bichloride of mercury, and 18, or 27.6 per cent., recovered, while 35 were treated on the expectant plan, or with some preparation of iron, and 15, or 42.8 per cent., recovered. In every case it was considered of primary importance to give as large an amount as possible of food and stimulants. It should, however, be remembered, in considering these results, that during the past year the internal use of the bichloride of mercury in the treatment of laryngeal diphtheria has been very widely practised, and its advocates may claim, and do claim, that under its use an operation became necessary in a much smaller proportion of the cases, and that, therefore, operative interference was needed only in the unusually severe cases which were not controlled by this drug.

Average age, three years six and three-quarter months; of those that died, three years five months; of those that recovered, three years eight months (one adult case was omitted in this calculation). In fatal cases the average length of life after intubation was two days and two hours; in cases of recovery, the average time of tube in the larynx was six days and ten hours. Urine contained albumin in 51 cases, no albumin in 7 cases, and was not examined in 42 cases. At the time of operation twenty-one of the patients were suffering from severe sepsis, and others had the laryngeal diphtheria complicated by measles, scarlet fever, pregnancy, pneumonia, bronchial diphtheria, and pertussis.

During the period of time covered by the foregoing summary, namely, October 28, 1888, to November 30, 1889, in addition to the cases of laryngeal diphtheria, the details of which are given in the notes, I was called to see twenty-nine cases of diphtheritic laryngitis, besides a number of cases of dyspnœa, due to catarrhal disease, two cases of pneumonia, four or five cases of naso-pharyngeal obstruction from diphtheria, one from post-pharyngeal abscess, and one from a combination of enlarged tonsils and adenoid vegetations in the vault of the pharynx. Of the cases of laryngeal diphtheria, three died before my arrival,[1] fourteen recovered without operation, it being decided by the attending physician and myself that it would be wiser to defer the operation until the stenosis became more severe. Of these cases two occurred in my own practice, and the remaining twelve in the practice of others.[2] Eight had undoubted laryngeal diphtheria, but the obstruction as shown by the strength and extent of the respiratory sound, was not sufficient to cause danger, or even discomfort, and therefore an operation would have been of no advantage, but rather the reverse. Of these cases all died.[1]

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[1] One with each of the following gentlemen: Dr. Osgood Mason, Dr. H. D. Chapin, and Dr. DeWitt Hitchcock, of Long Island City.

[2] Dr. H. G. Lyttle, Long Island City, Dr. G. V. Hann, Dr. David Froelich (2), Dr. G. D. Spor, Dr. R. B. Talbot, Dr. Bernard Hughes, Dr. E. V. Silver, Dr. D. H. Stewart (this case also had pneumonia), and Dr. Leonard Weber.

Notes on Cases.

201. There was well-marked evidence of pulmonary invasion, as shown by high temperature (105° F.), rapid respiration and a dry, boardy respiratory sound. For one month after the removal of the tube, it seemed as if the child might die at any time from diphtheritic marasmus, but the appetite slowly returned and he finally made a good recovery. Patient of Dr. C. W. Bohmfalk.

203 and 204: brothers. These children lived in Astoria. In the first case, membrane was expelled through the tube after the operation; and, in the other case, membrane was coughed up before the operation. The latter was a case of ascending croup, beginning in the trachea and extending up to the subglottic region of the larynx, but not involving the cords. This accounts for the clear voice and the short duration of the dyspnœa, in spite of the fact that the obstruction to respiration was extreme and there was positive evidence of membrane in the larynx. Patients of Dr. H. G. Lyttle.

208. Membrane was coughed up shortly after the insertion of the tube. At the time of operation it seemed like one of the most hopeless of cases. Patient of Dr. J. A. Roth.

209. A brother and a sister died the same week from diphtheria, but in neither case was the larynx involved. Patients of Dr. R. B. Burton.

210. Membrane appeared, for the first time, on both tonsils three days after intubation. The child did well and the tube was removed on the eighth day, although membrane was yet present in the pharynx. For thirty hours the child was bright and playful, and he was apparently doing well. Suddenly there was a rapid rise of temperature, and the patient died in thirty-two hours from an extension of the diphtheritic process to the bronchi. Patient of Dr. J. C. Schmincke.

213 and 215. Both hopeless septic cases from the outset. Patients of Dr. R. B. Burton and of Dr. Branch Clark.

216 and 217: brothers. Hopelessly septic cases. Patients of Dr. H. G. Lyttle.

218. Several days before this child became ill, a brother, aged eight years, died of diphtheria; and following this child's death the mother was taken down with a severe attack from which she recovered. Patient of Dr. E. A Bracklow.

220, 222, 227 and 228 were absolutely hopeless cases. The operation was done to relieve the suffering of the patients. Patients of Dr. R. H.

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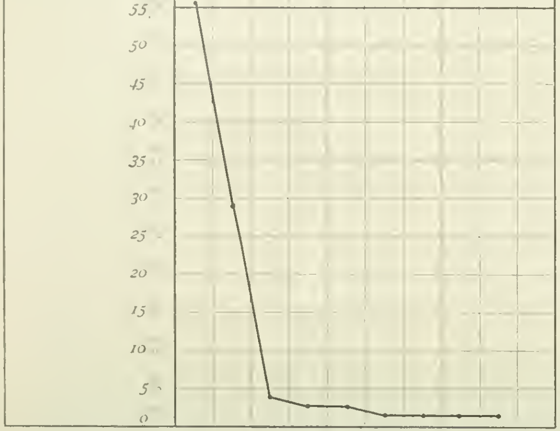
[1] One was seen with Drs. J. Lewis Smith and Dr. C. J. Dumond, one with Dr. Leonard Dessar, one with Dr. M. Vinton, one with Dr. S. B. Allen, one with Dr. H. N. Vineberg, one with Dr. J. H. Ripley and Dr. L. Emmet Holt, one with Dr. DeWitt Hitchcock and Dr. B. G. Strong, and one with Dr. J. Lewis Smith and Dr. Henry Griswold. Four cases refused permission to operate. All died, as follows: Two with Drs. R. B. and A. I. Burton, and one with each of the following physicians: Dr. J. H. Lurie, Dr. G. V. Hann.

TABLE I

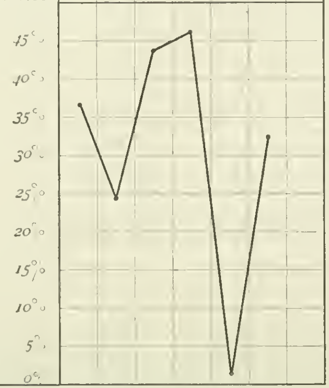
	Extension to Bronchi	Sepsis	Sudden Heart Failure	Pneumonia	Exhaustion	Uræmia	Scarlet Fever	Asphyxia	Œdema of Lungs	Total
Number of Cases	37	19	3	2	2	1	1	1	1	67
Per Cent of Cases	55.2	26.3	4.4	3.	3.	1.4	1.4	1.4	1.4	



This table shows the relative number of deaths from each cause.

TABLE II

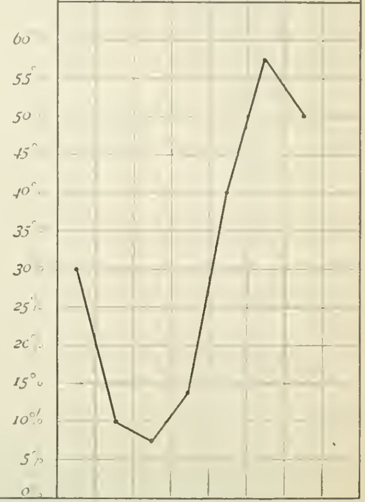
	1 to 2 days	2 to 3 days	3 to 4 days	4 to 5 days	5 to 6 days	6 days and over	Total
Number of Cases	19	41	23	11	3	3	100
Per Cent of Recoveries	36.8	24.4	43.4	45.4	0.	33.3	33.3



This table shows the percentage of recoveries according to the duration of laryngeal symptoms before operative interference became necessary.

TABLE III

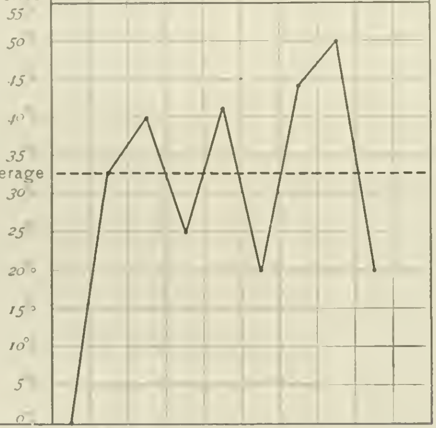
	1 to 2 days	2 to 3 days	3 to 4 days	4 to 5 days	5 to 6 days	6 days and over	None	Total
Number of Cases	10	10	13	7	5	19	12	76
Per Cent of Recoveries	30.	10.	7.7	14.2	40.	57.8	50.	



This table shows the percentage of recoveries according to the duration of pharyngeal or nasal diphtheria before operation became necessary.

TABLE IV

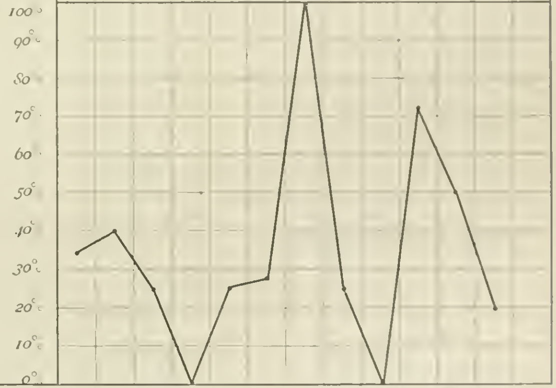
	Under 1 year	1 to 2 years	2 to 3 years	3 to 4 years	4 to 5 years	5 to 6 years	6 to 7 years	7 to 8 years	8 years and over	Total
Number of Cases	5	18	20	20	12	5	9	6	5	100
Per Cent of Recoveries	0	33.3	40.	25.	41.6	20.	44.4	50.	20.	33.3



This table shows the percentage of recoveries according to age.

TABLE V

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Number of Cases	12	10	12	6	8	7	2	4	3	7	14	15	100
Per Cent of Recoveries	33.3	40.	25.	0.	25.	28.5	100.	25.	0.	71.4	50.	20.	33.3



This table shows the percentage of recoveries for each month.

Hayes, Dr. M. L. Healy, Dr. E. M. Moffett, and Drs. A. Jacobi and S N. Leo.

226. This patient was an adult and pregnant (sixth month). No membrane could be seen either in the pharynx or nares at any period of the illness; and a laryngoscopic examination by Dr. Ripley showed an œdematous condition of the epiglottis and ventricular bands, but no pseudo-membrane. Immediately after intubation, a large cast of pseudo-membrane was expelled. At the time of the operation the patient was comatose and could have lived but a short time. The tube was inserted without difficulty while she was lying on her back in bed. She quickly rallied after the obstruction was removed, and in a few hours seemed to be in a fair condition. She died in forty-two hours from bronchial diphtheria. Patient of Drs. John Ripley and F. A. McGuire.

During the last twelve months I have seen two other cases of laryngeal diphtheria in adults. Both died. The first case, with Drs. Ripley and Holt, suffered from a very severe type of pharyngeal diphtheria, and, although the laryngeal obstruction disappeared, she died from bronchial diphtheria. In the second case, the disease began in the larynx and the patient was unconscious when operated upon by Dr. O'Dwyer. I saw her several hours later. There was moderate adenitis with great swelling of the neck, especially anteriorly. A moderate amount of dyspnœa due to some swelling over the top of the tube. The pharynx was red but no pseudo-membrane was visible. She was pregnant (fourth month). During the next twelve hours most of the swelling of the neck disappeared, but pseudo-membrane covered part of the soft palate. She was conscious and in very good condition, but had not the least recollection of the operation or our visit in the evening. Two days after the operation she aborted, and three and a half days after the operation she died of bronchial diphtheria.

232. This case was followed by paralysis of the ocular and pharyngeal muscles, and of the legs; and for a long time remained in that condition which has been aptly called diphtheritic marasmus. The mother, who nursed the child, afterward died of diphtheria. With Dr. G. V. Hann.

233. All the other children (two) had pertussis followed by scarlet fever and diphtheria. Both recovered.

234. This child was unconscious and pulseless at the time of operation, and it was an hour and a half before she began to rally. With Dr. D. Schmidt.

237. A hopelessly septic case. With Dr. J. A. McLoughlin.

242. The child had marked sepsis. At the time of operation it was pulseless, and although the tube was quickly inserted and plenty of air entered the lungs, the child never rallied, dying in about fifteen minutes. A second child in the same family, older and not septic, recovered after tracheotomy. Patient of Dr. W. B. Pritchard.

241. This child was profoundly poisoned by the diphtheria, and convalescence was very protracted. Child of Dr. H. G. Lyttle.

246. An older sister had scarlet fever and diphtheria, and the mother had a mild attack of pharyngeal diphtheria. Both recovered. Patients of Dr. J. R. Cypert.

247. This was a case of ascending croup. With Dr. Alexander Hadden.

253. Followed by paralysis of eye, pharyngeal and leg muscles. Patient of Dr. J. Lewis Smith.

259. Another child convalescent from diphtheria.

260. During the course of this attack, there were seven apparently complete casts of the trachea coughed out. Most of them had bronchial branches. Patient of Dr. Wooster Beach.

261. A large cast was coughed out through the tube. Patient of Dr. A. B. Pope.

274. There was undoubted bronchial invasion at the time of operation. Marked sepsis. With Dr. E. J. Ware.

275. Unconscious before operation. She rallied in about half an hour. Patient of Dr. J. Harvie Dew.

277. On account of loose membrane below the tube, which the child was unable to expel, I did tracheotomy. Patient of Dr. Charles Milne.

285. There were three casts of the trachea with bronchial branches expelled, the second of which had branches from the sixth division of the bronchi. This was such a remarkable specimen that I have carefully preserved it. With Dr. G. D. Spor.

288 and 290 were hopeless cases. With Dr. J. L. Smith and Dr. D. L. Hubbard.

287. This is the only case I ever saw die during the operation. There was no trouble to place the tube in the larynx, but, at the beginning of the operation, the child was pulseless, and from the temperature and other evidences of pulmonary invasion, was hopeless. There was loose membrane in the trachea, and the child being unconscious, it was unable to get rid of it. With Dr. Henry Muhlfeld.

296. There was evidence of bronchial diphtheria before operation. Patient of Dr. John H. Ripley.

294. Four days before intubation the mother gave the baby a teaspoonful of spirits of ammonia by mistake for lime-water. Hoarseness and dyspnœa appeared in two hours, which gradually grew worse with only slight intermissions, until operative interference became necessary. At this time there were patches which simulated pseudo-membrane on the tongue, and the pharyngeal and buccal mucous membrane, and the child had quite an extensive pneumonia, with a temperature of 104° F., pulse 144, and respiration very rapid. Patient of Dr. G. F. Morris.

CHRONIC PURULENT OTITIS MEDIA AS A CAUSE OF PERSISTENT FACIAL NEURALGIA.

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Owing to the rich nerve-supply of the tympanic cavity, any pathological condition of its lining membrane, as we might naturally expect, may be attended by complex nervous phenomena. Thus Toynbee[1] cites a case in which a rupture of the membrane was the cause of a sensation of cold in the end of the tongue, while Moos,[1] Wilde,[2] and Urbantschitsch[3] cite cases in which irritation of the exposed chorda tympani caused abnormal sensations in the tip of the tongue. Brunner[4] and Urbantschitsch[5] mention cases in which division of the chorda tympani caused total loss of taste in certain portions of the tongue, the function gradually returning to a greater or less degree; while McBride[6] reports a case in which the removal of an aural polyp was followed by almost complete loss of the sense of taste in the corresponding side of the tongue. Carl[7] observed in a case of chronic purulent otitis media, that there was perversion of the sense of taste in the anterior two-thirds of the tongue. Following in this line, Urbantschitsch[8] investigated fifty cases of purulent otitis media, with the result that, in nearly all, more of less perversion of the sense of taste existed upon the affected side.

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[1] Diseases of the Ear, London, 1865, p. 184.

In all of these observations the sense of taste was affected, but we find no mention of any pain. In a case reported by Noyes,[9] in addition to the perversion of taste, there was a feeling of fulness and heaviness in the affected side of the head. Hartmann,[10] quoting Moos, states that trigeminal neuralgia may be an accompaniment of acute purulent inflammation of the middle ear, of chronic mastoiditis, or of cholesteatoma. Roosa[11] mentions that pain in the ear, unaccompanied by any gross lesion, is probably due to some pathological condition of the branches of the trigeminus within the tympanic cavity, but I find no mention, in his work, of neuralgia of the trigeminus accompanying a chronic otitis media either of the catarrhal or purulent form. Gruber[12] cites a case reported by Guerder in which neuralgic pain in the maxillary region, accompanied by an herpetic eruption and salivation, resulted from a catarrhal inflammation of the tympanic mucous membrane. Peck[13] reports a case of acute purulent otitis media, in which severe pain in the last two molars on the corresponding side persisted until the cessation of the aural trouble. The teeth were sound, and the author looks upon the pain as neuralgic, and caused by the inflammation within the tympanum. Jackson,[14] in reviewing the different nervous manifestations occurring in the course of chronic purulent otitis, makes the statement that neuralgic pain usually points to an acute exacerbation, but does not go into details.

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[1] Arch. of Ophth. and Otol., 1869, vol. i. p. 140.

[2] Arch. für Ohrenheilk., vol. v. p. 235.

[3] Lehrb. der Ohrenheilk., Wien, 1884, p. 302.

[4] Zeit. für Ohrenheilk., vol. ix. p. 156.

[5] Op. cit., p. 303.

[6] Edin. Med. Journ., 1880 and 1881, vol. xxvi. p. 902.

[7] Archiv. für Ohrenheilk., 1876, vol. x. p. 152.

[8] Op. cit., p. 302.

[9] Trans. of Amer. Otological Society, 1884, vol. i. p. 556.

[10] Krankheiten des Ohres, Berlin, 1889, p. 170.

[11] A Treatise on Diseases of the Ear, New York, 1885, p. 561.

[12] Lehrbuch der Ohrenheilk., Wien, 1888, p. 419.

[13] Independent Practitioner, 1883, p. 401.

[14] Lancet, 1877, vol. i. p. 415.

A careful search through medical literature has failed to reveal any cases other than those cited above, in which a persistent facial neuralgia had its origin in a chronic inflammation of the tympanum, and for this reason I report the following case:

Mrs. M., aged fifty years, consulted me early in June, with the history that, about two months before, she had suffered with an attack of "la grippe" which had greatly impaired her general health. About two weeks before her visit she was seized with severe pain in the right ear, lasting about twenty-four hours, followed by a slight watery discharge, which at the date of the consultation had ceased, although the hearing remained impaired. This ear, upon examination, presented the ordinary appearances of an acute catarrhal otitis media, and under appropriate treatment its function was completely restored, and as it plays no further part in the history, will not be alluded to again. One week after this attack, and one week before her visit, the patient began to have considerable pain in the left ear, and the auricle became tender to the touch; for the relief of this pain, the patient had syringed the ear with warm water, but was obliged to discontinue the use of the syringe, as it increased the pain greatly.

When questioned, she stated that the hearing in the left ear had been dull for about six years, during which time she had been subject to attacks of severe facial neuralgia, involving principally the branches of the first division of the fifth nerve upon the left side; these attacks were more severe whenever she had a cold in the head. She also stated that there had never been any discharge from this ear, or any pain, until the present attack.

An examination of the left ear revealed the hearing much reduced both for the watch and for conversation, and bone-conduction better than aerial conduction. The auricle was tender to manipulation, and pressure in front of the tragus was painful. On introducing a speculum, the canal was found to be considerably swollen, especially along the posterior wall, although there was no localized focus of inflammation. A portion only of the anterior segment of the membrana tympani could be seen, and this was of a dead-white color. The remainder of the membrane was covered with a grayish-white mass, extending outward into the canal for a considerable distance. Gentle manipulation with the curette or cotton-tipped probe failed to loosen the mass. Under the assurance that there had never been any discharge from the ear, and no previous attack of pain, I proceeded to remove the mass in the canal with the syringe, but although no force was used, the entrance of the water was accompanied by severe pain. Another examination now revealed the entire membrane of a dull grayish-white color, calcified in places and adherent everywhere to the promontory; in the posterior superior segment there was a small opening through which the lining mucous membrane of the tympanum could be seen. This opening was not more than two mm. long and one broad. It was easily seen that the mass in the external meatus had hermetically sealed a perforation, and that by its removal the middle ear had been exposed. In view of this condition and of the history of slight pain the week before, the patient was advised that there might be some discharge from the ear, and, the meatus being closed with cotton, returned home. The next day she reported that the ear had continued to discharge a thin, bloody serum since leaving the office the previous day. An examination revealed the fundus of the canal filled with serum, and drying this, a pulsating spot could be seen at the site of the perforation mentioned in the first examination; the drum membrane was reddened, swollen, and opaque, the handle of the malleus being scarcely visible.

For two days the ear was thoroughly cleansed, and boric acid was insufflated; under this treatment the discharge diminished, and the patient returned to her home, the directions being to keep the ear thoroughly cleansed with the syringe in case the discharge reappeared.

Four days later the patient again appeared. For two days she had suffered severe pain in the head and face, the latter being of a neuralgic character, and, as she expressed it, of the same kind that she had suffered from at intervals for the last five or six years; the discharge from the ear was still profuse. Examination revealed the canal much swollen, especially along the posterior aspect. Membrana tympani in much the same condition as at last examination, but at the site of the perforation there was a mass of granulation tissue, about double the size of a pin-head. Pressure on the mastoid was somewhat painful, and over the Eustachian tube decidedly so. A blister was applied over the region of the tube, extending upward over the lower two-thirds of the mastoid, and the patient was ordered to syringe the ear frequently with lukewarm water.

Under the above measures, together with the application of a solution of the perchloride of iron to the granulation tissue, and the subsequent insufflation of boric acid and alum, the granulation tissue disappeared, and the discharge diminished, but did not cease; the neuralgia also was much improved. Next, by means of a Blake middle-ear syringe, a few drops of a solution of silver nitrate, ten grains to the ounce, were introduced into the middle ear, through the perforation in the posterior superior quadrant. The fluid immediately made its way into the pharynx, and the pain, which was rather severe for the moment, soon disappeared.

Four days later the patient called and said that the discharge was much less—in fact, that it was giving her no trouble. She also remarked that there had been no neuralgia. A small amount of boric acid was insufflated, after thoroughly drying the ear, and the patient went out of town, and did not report for four weeks. During this period the ear had given her no trouble, and it had not been syringed, although, in this, the directions had not been carried out. Examination revealed a little thick pus in the canal, and upon wiping this away, granulation tissue was seen in the region of the perforation. A few applications of the perchloride of iron caused these to disappear, and at the time of writing, the discharge has ceased, and the patient is well. There has been no facial neuralgia since the ear began to improve, and the patient says that she has never passed so long a time without an attack, although the general health is no better, or perhaps not quite as good, as it has been in former years.

The membrana tympani, now that the discharge has ceased, shows clearly evidences of former purulent trouble, of long duration. It is calcified in many places, is adherent to the promontory throughout the entire extent of the membrana vibrans, and, in addition to the perforation already mentioned, exhibits, in the anterior inferior quadrant, evidences of an old perforation, a little larger than a pin-point. This perforation is perfectly dry, and evidently adherent by its margin to the promontory, and has certainly played no part in the present attack.

Looking now at the history of the case, it seems only logical to conclude that the attacks of neuralgia, dating, as they do, from the time that the hearing first became impaired, were due to an inflammatory process in the middle ear, involving some of the branches of the tympanic plexus. The inflammation probably began in the upper part of the tympanic cavity, resulting in the perforation in the posterior superior quadrant, the covering of which I removed at my first examination. This process apparently continued for years, without the formation of enough pus to give rise to discharge, although that it spread to the atrium is probable from the old perforation in the membrana vibrans. Whether the acute exacerbation, from which she had suffered when she saw me for the first time, would have resulted in a discharge, had I not removed the crust covering the perforation, thus admitting air to the tympanic cavity, is only a matter of conjecture. Certainly, in view of the relief obtained from the neuralgic symptoms by the treatment of the aural trouble, the acute attack must be looked upon as a piece of good fortune.

I should not have related the details of the case so fully, had I not believed that trifacial neuralgia, as a symptom of chronic purulent inflammation of the middle ear with very slight discharge, was among the rarest of affections with which we are called upon to deal. Neither would I attribute the neuralgia to this cause, could any other reason be found for it. No other exciting cause existed, and in view of the almost instant relief afforded by treating the aural condition, it seemed hard to believe that they held any other relation than that of cause and effect.

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A CLINICAL STUDY IN THE DIAGNOSIS AND TREATMENT OF HYPERPHORIA,

WITH A REPORT OF FOUR CASES.

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In this paper I shall discuss one of the propositions enunciated by Dr. G. T. Stevens, of New York—namely, that hyperphoria is responsible for ocular and muscular anomalies, together with other abnormal conditions of the nervous system less particularly defined, and shall attempt to show practically, in the history of a few cases, the value of this proposition.

Hyperphoria is properly defined as "that condition of the ocular muscles in which, with a minimum of tension, a deviation of one visual line above the other would result." In other words, it is a tendency to upward deviation of the visual axis of one eye when both are supposed to be fixed in a small luminous object, such as a candle-flame, at 20′ distance. The eyes are said to be at rest, or in equilibrium, when, without accommodation, the visual axes meet in a small object at the distance of 20′. They are not, it will be remembered, mathematically parallel, but the small angle at their point of fusion may be disregarded.

In hyperphoria there is a derangement of this parallelism by a clonic deviation upward of one of the axes (hypertropia), or by a tonic tendency to destroy vertical equilibrium (hyperphoria). This involves necessarily a lateral deviation—esophoria or exophoria, either or both (Eso., far; Exo., near). Since vertical fixation is unattainable, no incentive exists for equilibrium of the lateral muscles, and in fact it is not found, except as an accidental and transient manifestation.

To determine the presence of hyperphoria, a special apparatus is necessary. Lateral insufficiency may be detected by the Von Graefe test—inducing diplopia by means of a prism of 6° base down or up. On account of the weakness of the prism, a slight malposition or an approximation to the vertical position would not seriously affect the result. In dealing with the vertical muscles, however, it is necessary to use a prism of 10° or over, when a slight malposition of the prisms from carelessness of the physician or want of symmetry of the patient's head will vitiate the result. Such an apparatus is Stevens's Phorometer (for description see *Arch. Ophth.*, June, 1887). A recent improvement, the substitution for the double horizontal prism of a pair of rotating prisms, greatly facilitates the examination. It is independent of, and its readings are not vitiated by, moderate movements of the patient's head; it reveals the diagnosis instantly, and records the degree of deviation (under 6°).

In testing for hyperphoria, several examinations are demanded. The diagnosis cannot be made, in kind or degree, at one sitting, as the strength of the muscles varies from day to day, owing to temporary and modifying conditions, which may be general or local. Again, if spectacles are worn by the patient they must be accurately centred, or the results will be modified and the true diagnosis remain undiscovered. It has been my practice in cases of ametropia to make the distant tests without correcting lenses, unless the defect of vision is too great to allow of accurate observation, believing that hyperphoria is practically uninfluenced by the condition of refraction, and that greater danger of incorrect diagnosis lies in lenses which are not accurately centred than in ametropia. Presbyopic correction, when worn, should be made for all near tests.

The symptoms of hyperphoria cannot be distinguished from the symptoms which belong to other muscular or accommodative strain, and while it is both interesting and instructive to note the presence or absence of the nervous phenomena which are attributed to this affection, no reliable or logical conclusions can be deduced from their enumeration which shall aid in the determination of the cause. They are partly local, largely reflex; the former including diplopia, pain, smarting, burning, etc.; the latter neuralgia, headache, chorea, insanity, epilepsy, palpitation, constipation, etc. My own experience in the treatment of the grave functional disorders of the nervous system, by means of the measures advocated by Stevens and seconded by others, does not permit me to form an intelligent opinion as to their efficacy. Such patients do not ordinarily consult the ophthalmic surgeon, but the neurologist; and although I have frequently examined epileptics and choreics for some evidence of ocular disturbance, it has thus far been my fortune never to have met with a case in which I could conscientiously advise prisms, or tenotomies, as the sole means of relief. On the other hand, the cases of hyperphoria which have been under my treatment have presented no symptoms of insanity, epilepsy, or chorea. They have complained, for the most part, of confusing the letters in reading, pain in the eyes, headache, photophobia, exhaustion following an evening at the theatre or a day's shopping, and of the other well-known complications of accommodative strain. They have been, with singular unanimity, free from mental or intestinal symptoms. From their own unaided description of their sufferings an accurate diagnosis could not be made, and this is true whether an error of refraction were associated with hyperphoria or whether it were hyperphoria in emmetropia.

Diplopia may or may not be present. It should be sought for by every known test, since its discovery is an important item in the diagnosis and treatment.[1] When diplopia exists, the diagnosis may be made by the relation of the two images to each other; when absent, the diagnosis cannot be made without a phorometer.

Do errors of refraction bear a causative relation to hyperphoria? That they do has not as yet been proved, and the assumption of such relation is therefore only speculative. The third nerve supplies the superior, inferior, and internal recti, inferior oblique, ciliary muscle, and iris. There can be no accommodation without convergence. How can there be convergence without simultaneous stimulation of all other muscles innervated by the same nerve? The relation of accommodation to convergence is not disputed; the same relation must hold with the superior and inferior muscles. It must be remembered that these muscles average only one-fifteenth part of the strength of the internal, and yet, however slight, comparatively, their contraction may be, it must be considered. Convergence and divergence are the result of the action of two different nerves; upward and downward deviation, of one only: hence hyperphoria, which is a want of coördination between two sets of muscles receiving their nerve force from a common source, must owe its origin to others than those that operate in the development of eso- or exophoria. Speaking generally, internal squint is associated with and dependent upon hypermetropia; external squint, with and upon myopia. To neither of these errors of refraction can hyperphoria be attributed. That it is present in individuals who have H., M., and As., is no evidence that it arises from those conditions. Stevens's table (*loc. cit.*) quotes 100 cases of hyperphoria (200 eyes) among 45 Em., 42 M., 73 H., and 40 As., but proves nothing. The same figures may be equally well or badly used to demonstrate any other ocular or bodily ailment. Tables adduced in evidence that heterophoria and errors of refraction are the causes of functional nervous diseases—insanity, epilepsy, chorea—because maniacs, epileptics, and choreics have some refractive or muscular anomaly, are equally misleading. Perfect muscular equilibrium is as rare as Em.,[1] and to assert that the absence of it is the cause of nervous disturbances "more than any other," is quite as unreasonable as to say it is the cause of consumption or of smallpox.

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[1] For an elaboration of this part of the subject, see Stevens's article on Hyperphoria, in Arch. Ophth., June, 1887.

Again, hyperphoria is found in every variety of misshapen eye, not exclusively in one. Finally, it is relatively as frequent in emmetropia as in ametropia.

On the other hand it is evident, whatever may be the cause of hyperphoria, that it is a factor in the causation of functional nervous affections in some individuals,[2] and that its importance in certain cases has not been overestimated. It is admitted that headache, dizziness, and vertigo in neurotic patients are induced by strain of the accommodation, and it is no argument to the contrary to say that because all patients with refractive errors are not subject to these affections that none are. But it is equally unjust to attribute the symptoms entirely to the ocular condition. There must be a constitutional dyscrasia, an exhaustion of the nervous system, a "nervous prostration," a neurotic tendency—a subnormal nervous power and force, whatever name be given to it. This is the underlying, predisposing cause. Accommodative asthenopia *and* neurotic tendency are responsible for the nervous manifestation. This is no theory. It is daily proved in practice. Many published and unpublished cases are in evidence to prove that refractive errors have been the disturbing cause in certain abnormal manifestations of the nervous system which resisted all treatment until ametropia was suspected and relieved. And if reflex symptoms are caused by prolonged, irregular, or excessive contraction of the ciliary muscle, and of the internal and external recti, may they not also be caused by the superior and inferior recti under similar conditions—assuming, in the latter case as in the former, the existence, either inherited or acquired, of a neurotic tendency or disposition upon which the superstructure of a specific or definite nervous disease may arise?

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[1] "The Relation of Errors of Refraction and Insufficiency of the Ocular Muscles to Functional Diseases of the Nervous System," by D. B. St. John Roosa, N. Y. Med. Rec., April 19, 1890.

[2] "May Ocular Insufficiency Produce Nervous Manifestations?" By Allen M. Starr. N. Y. Med. Rec., January 4, 1890.

Muscular asthenopia is as familiar as accommodative. Thirty years ago, Von Graefe formulated laws for its diagnosis and treatment which guide us to-day, and while the terms employed by him—"insufficiency of the interni," "insufficiency of the externi"—have been replaced by shorter and more accurate designations, nothing really new has been added to our knowledge. This cannot be truly said of the relation of the vertical muscles with each other and with the lateral muscles. Stevens has contributed to the science of ophthalmology the valuable results of his studies and investigations; and if their importance and application have a narrower range than he claims for them, experienced and fair-minded men will not be slow, on that account, to accord him due credit for his contributions to this branch of scientific medicine.

The first two cases recorded below are not illustrations of hyperphoria, and perhaps should be excluded from the paper, but as their histories and symptoms are identical with typical cases of hyperphoria as described by Stevens, and yet showed vertical muscular equilibrium, their recital is, I think, consistent and profitable.

CASE I.—Miss N., aged twenty-five, complained of constant headache, which was aggravated by the near use of the eyes. She was obliged to give up her work, the making of artificial teeth, on account of her great distress. She had no constitutional ailment, and but for her headache, which she believed to be ocular, would have been entirely well. Under a mydriatic (dubosia) her refraction was: R. + 0.75c. ax. 90° = $\frac{XX}{20}$.
L. + 0.75c. ax. 90°.

This correction was ordered for constant use. After several weeks there was no relief from headache, nor increase of ability to work. In examination for muscular anomalies, "insuf. of int. rect." = 6° far, 12° near, was found. Prism 3° base in O. U. gave temporary relief. Later, partial tenotomy of ext. recti. Immediately afterward: Esoph. far = 4°; Exoph. near = 4°. In a few days: Exoph. far = 1°, near = 10°.

No relief followed the tenotomy. The muscles varied in strength almost daily. Add. = 10–20°, abd. = 10–12°; circum. 3–8°.

After the tenotomy failed, I tested Miss N. anew with Stevens's improved phorometer, confidently expecting to find hyperphoria. In this expectation I was disappointed, for though the examinations were made for several consecutive days, *each test showed equilibrium of the vertical muscles.*

My treatment by cylinders, prisms, and tenotomy was a marked failure.

CASE II.—Mr. C., aged forty-six, complained for many years of pain in the eyes, and of headache, which ensued in a very few minutes after every attempt to read or write. During these years he had consulted a number of the most distinguished ophthalmic surgeons in America and Europe, and had used lenses of various kinds, and kept his accommodation paralyzed by dubosia for three months without obtaining relief.

I ordered an accurate correction of his refraction (R.–25 $\bigcirc$ + 0.75c. ax. 45°; L.–25 $\bigcirc$ + 0.50c. ax. 135°), and combined these cylinders with a presbyopic glass.

Both pairs improved his vision, but did not lengthen the time he could read without suffering. Subsequent examinations with phorometer showed: Orthophoria far; Exoph. near = 10°; abd. = 5°, add. = 8°. Prism 3° base in O. U. were of no service.

Mr. C.'s headache and ocular pain were not benefited.

CASE III.—Mrs. L., aged twenty-five, a strong, healthy, phlegmatic woman, with no nervous tendencies, complained of twitching of right lid and pain over right eye, after long-continued reading. She had no *diplopia*, headache, blurring, or photophobia, and finally, no insanity, chorea, or epilepsy. (Dubosia) R. + 0.5 $\bigcirc$ + 0.1c. ax. 90° = $\frac{20}{\text{XX}}$. L. + 0.75 $\bigcirc$ + 0.5c. ax. 90° = $\frac{20}{\text{XX}}$. *R. Hyperphoria* = 2—3°. Exoph. far = 12°, near = 27°; abd. = 12°, add. = 20°.

Unless diplopia was developed by alternately covering and uncovering one eye, Mrs. L. never noticed it; whether it was constant or not would be difficult to determine.

The above lenses removed the slight asthenopia, and completely cured all symptoms. No other treatment.

CASE IV.—Miss J., of Bloomsbury, Pa., aged nineteen, delicate in appearance, nervous and quick in action; complained of severe asthenopia, neuralgic headache, blepharospasm, and inability to read more than five minutes without either causing these symptoms, or greatly exaggerating them. No diplopia. (Dubosia) R. + 0.25c. ax. 90° = $\frac{20}{\text{XX}}$. L. + 0.25 $\bigcirc$ 0.25c. ax. 90° = $\frac{20}{\text{XX}}$.

Double images were induced and maintained by the above described simple method after a few trials. *R. Hyperphoria* = 3½°; exoph., far and near, in great and varying degree. After a confirmation of this diagnosis, tenotomy of R. sup. rectus was performed. The entire tendon was divided, as *no appreciable modification of the hyperphoria followed partial division.* None of the neighboring attachments was severed. The immediate result was: *L. Hyperphoria* = 4°. Result in nine weeks—orthophoria far, exophoria near = 12°; in six months—

orthophoria far, esophoria near = 8; add. = 30, abd. = 10. Complete relief of all asthenopic symptoms, and a decided subsidence of the severe nervous conditions, followed within a few days after operation. She enjoyed absolute freedom from pain, and the power of prolonged use of her eyes in near vision was reëstablished. The hyperphoria was removed, and the exophoria, which before the tenotomy was very high, became esophoria. I advised no further treatment, believing that with the lapse of a longer period of time lateral muscular equilibrium would be established. The slight refractive error was not corrected. In this case the hyperphoria was the dominant element of disturbance, and complete success followed its removal.

Case V.—Miss H., aged eighteen, Wilmington, Del., a stout, fully developed, and fine-looking girl, but with evidences of a lack of muscular tonicity and of anæmia; ears and lips pale, localized anæsthesia of the skin. She complained of constant headache, increased by the slightest use of the eyes at the near point, occasional *double vision*, and general nervous exhaustion. The diplopia was a prominent but not constant symptom, and included both near and distant objects. It was easily induced without prisms and persisted sufficiently long to permit a thorough examination.

This case is typical. First: on account of the absence almost of converging power without divergence. This was shown by the varying position of the false image and the changing relation of the false and true images. After having induced diplopia, without prisms, in testing with candle at 20′, the image seen by the L. eye was lower (L. hyperphoria) and to L. side (homonymous); at 18′ it began to wander to the right, was lower, but did not fuse with, or at any time remain stationary under the other; inside of 18′ it was crossed and lower. The degree of deviation increased inversely as the distance. Throughout all the tests the image seen by the L. eye was always lower than that seen by the R.; *i. e.*, L. hyperphoria = 2–3° persisted as a constant condition; Esoph. far = 2°; Exoph. near = 15°.

Second: Stevens calls attention to the amblyopia which is frequently present in one or both eyes in hyperphoria. In Miss H.'s case V. on first examination was $\frac{20}{\text{XL}}$; no lesion of media or fundus. (Dubosia) R. + 0.75c. ax. 90° = $\frac{20}{\text{XXX}}$. L. + 0.75c. ax. 90° = $\frac{20}{\text{XL}}$. With this correction, and during paralysis of accommodation, vision equalled only two-thirds of the normal in the R., which was considered by me as the better or fixing eye.

After consultation with Dr. William Thomson, Miss H. was taken from school, ordered tonic remedies, nourishing diet, and exercise in the open air. After one month's treatment, the only improvement was in V., R. $\frac{20}{\text{XXX}}$, L. $\frac{20}{\text{XXX}}$, probably brought about by wearing the astigmatic correction. The faulty action of the muscles was unchanged. With Dr. Thomson's approval, and with his assistance, I divided the tendon of the L. sup. rect. in the middle, leaving the edges intact, being guided in the extent of the cutting by the phorometer. After several interruptions for testing the effect, orthophoria for distance was obtained.

The vertical displacement was entirely corrected. The *lateral disappeared*, and Exoph. near = 3°. 29*th* (three days later), she "has had no double vision; *I cannot induce diplopia without a prism.*" Exoph. far = 2, near = 4; no vertical deviation. 3*d:* V. = $\frac{20}{xx}$. Orthophoria far; Exoph. near = 3°; add. = 20°, abd. = 8°; circum. = 3°. 12*th:* Occasional double V. L. Hyperphoria = 1°. In induced vertical diplopia L. light (eye) wanders to R. and L., as before, according to distance; abd. = 7°, add. = 32°. Ordered prism 1° base up L. 24*th:* Double V. on lying down. Complained of malaise; fainted a few days ago, no headache unless she reads, and then it comes on in a very few minutes. Esoph. far = 3°; Exoph. near = 4°. L. Hyperphoria = 1°. 2*d:* R. inf. rect. divided partially. Immediately afterward: R. Hyperphoria = 1°. 3*d:* Orthophoria. 12*th:* Double V. when recumbent. R. Hyperphoria = $\frac{1}{2}$°; no lateral deviation; add. = 20°, abd. = 10°; circum. = 3°. Asthenopia has disappeared. "Read one hour by artificial light without discomfort." This satisfactory condition has remained unchanged, but it was found at the last examination, made three months after the tenotomy, that Miss H. had diplopia in *every direction*, at the extreme limits of the common field of V. This cannot be ascribed to a want of equilibrium of any one set of muscles, but rather to deficiency of power of all the muscles.

The final result is doubtful. The benefit from the operative procedures was relief from annoying double V., and ability to read a desirable length of time with comfort.

Case VI.—Mrs. H., aged forty-seven, sent to me by Dr. R. R. Bunting, Roxborough, Philadelphia. For many years she had suffered headache severe enough to require a day's rest in bed, after using the eyes for reading or sewing only a short time, and after physical exertion. It always followed a day's shopping, an evening at theatre, a long walk, or any unusual excitement. Her nervous system was exhausted. She had so-called nervous prostration, and had almost resigned herself to invalidism. I examined her in December, 1884, for refractive error.

She was wearing R. + 1.25c. ax. 180°, L. + 1s, for near use, which helped but did not relieve her asthenopia. I found, under dubosia: R. + 2c. ax. 175° = $\frac{20}{xx}$. L. + 0.25 ⌣ 0.25c. ax. 180° = $\frac{20}{xx}$, and ordered it for constant use. Eighteen months later + 0.5s. was added for presbyopia. With these two pairs of glasses Mrs. H. was enabled to use her eyes better than with the first pair, yet they were unsatisfactory. Her V. was improved, *but she could not wear the glasses* constantly. The dizziness and headache were no better. Mrs. H. continued to suffer until March, 1890, when she consulted me again, at my request, to determine the presence or absence of any muscular anomaly by means of the phorometer, which I had not used in previous examinations. I found the above refraction slightly modified: R. + 2c. ax. 175° = $\frac{20}{xx}$. L. + 5c. ax. 180° = $\frac{20}{xx}$. With, and without, this correction, in repeated tests, R. *hyperphoria* = 2° was determined. Esoph. far = 2°; Exoph. near = 1°; abd. = 6°, add. = 2°. Sup. rect. R. (and inf. rect. L.) overcomes 3°. Sup. rect. L. (and inf. rect. R.) overcomes only 1°. *April 1st:* Total division tendon sup. rect. R. Immediate result was: L. Hyperphoria = 1½°. *5th:* L. Hyperphoria = 3°. *13th:* No hyperphoria. Exoph. far = 5°; orthophoria near. Mrs. H. reports that she is certainly relieved of headache, can sew, read, shop, or exercise with no bad result. There was, six months later, no return of asthenopia, and general health decidedly improved. *She wears distant glass constantly.*

This case illustrates a point which has not received sufficient attention. Mrs. H. found it impossible to wear her astigmatic correction before operation; afterward she found it equally impossible to go without it. The explanation is not far to seek. Before the tenotomy, with her refractive error corrected, images were distinctly formed on each retina, and it required constant contraction on the part of the R. inf. rect. to prevent distressing, because distinct, double V. Without the correction, the indistinct blurred image of the R. was suppressed, or at least was not disturbing. After tenotomy the visual axes were parallel, and the eyes required lenses that made the images of equal size and clearness, since they fell on corresponding points on the retina.

The result of the tenotomy was an unqualified success, both in respect of its effect on the power to use the eyes without pain and upon the reflex symptoms.

Method of Operating.—Stevens has suggested special instruments, differing principally in size from those in use in strabismus operations. He advises a division of the tendon, either partial or complete, according to the degree of hyperphoria, and to stop the section where the axes of V. are on one horizontal plane. My own experience, limited as it is, does not confirm this teaching. How can orthophoria obtained immediately after a tenotomy be retained? Is it practicable or in accordance with the laws of pathology to suppose that no union of the divided structures will take place, and that the orthophoria will remain as a permanent condition?

The operator must determine in each case how much effect he should obtain, and no general law can be formulated which shall cover all cases. In my own operations I have aimed to produce an opposite hyperphoria equal in degree to the original, and have succeeded fairly well, with one exception, which I afterward regretted, since a second operation became necessary.

Is there a latent hyperphoria? It seems impossible to determine its existence before operating, and our only safeguard is repeated and thorough examinations, allowing the muscles ample time to fall into that pathological position which is one of rest for them. That the total deviation is not ascertained before tenotomy, is proved by the subsequent history of a case operated on by Dr. Wm. Thomson.

Should, then, the tenotomy be partial, or complete? And, Can hyperphoria, with its array of reflex symptoms, be cured by a tenotomy limited to the centre of the tendon? I confess the results secured by others have not been attainable in my own experience. I have divided, in a number of instances, other than those here recorded, the centre of the tendon, leaving its edges and attachments to the capsule intact, but without effect. A measurable displacement of the image followed only when I had made a complete section.

It is important to determine which eye shall be chosen for operation. It must not be forgotten that functional hyper-, as well as eso- and exophoria, is an affection of two eyes and two or more muscles, and not of one eye or one muscle only. Other than muscular conditions may decide which is the weaker or stronger eye, and which muscle may with the greater benefit be cut—such as relative position and instability of one image, error of refraction, and inclination of the head. If there be no reason to suppose one eye more at fault than its fellow, the tenotomy may be divided between the sup. rect. of one and the inf. rect. of the other eye.

CONCLUSIONS:

That hyperphoria is a real affection, and that, while it may exist without causing symptoms, it is in some cases of the highest importance.

That it may produce reflex disturbances in an over-sensitive or exhausted system.

That reflex functional disorders are found in patients with hyperphoria, which are not caused by hyperphoria.

That it is not dependent upon errors of refraction.

That it should be sought for in every case of asthenopia.

That the degree can be determined only after repeated examinations.

That tenotomy, and not prisms, is the treatment for hyperphoria.

That in most cases the tendon should be completely divided.

Of the six cases reported above, two presented symptoms of hyperphoria when no want of equilibrium of the vertical muscles could be detected; one had hyperphoria with asthenopia, which was entirely relieved by the correction of the refractive error. Three had local and reflex symptoms due to hyperphoria, and were cured by tenotomies.

It may be objected that the cases are too few to enable one to deduce therefrom laws for general acceptance. No such deductions are made. Nothing more has been attempted than a truthful recital of the histories and a careful observation of the points presented to my own mind. They furnish so much data from which the reader may form his own opinion and draw his own deductions. The subject is new, attractive, and important, and deserves more impartial investigation and study than it has hitherto received.

252 S. SIXTEENTH STREET.

REVIEWS.

A Text-book of the Diseases of the Ear. By Dr. Josef Gruber, Professor of Otology in the Imperial Royal University of Vienna, etc. Translated from the second German edition by special permission of the Author, and edited by Edward Law, M.D.C.M. Edin., M.R.C.S. Eng., and by Coleman Jewell, M.B. Lond., M.R.C.S. Eng. With 150 illustrations and seventy colored figures on two lithographic plates. London: H. K. Lewis, 1890.

The author says in his preface: "The great advance which has taken place in the theory and practice of otology during the last ten years, imposes upon the teacher of this branch of medicine a task no longer possible to accomplish within the short space of time which it is customary to devote to it in the ordinary medical curriculum. This being the case, it must rest with private study to supply the unavoidable deficiencies left in this department."

The author is wise in arranging the study of the ear and its diseases by a preliminary description of the anatomy of the entire organ of hearing, preferring to thus give an idea of the anatomy as a whole, rather than to consider the structure of a part of the ear and then its diseases, as the latter course is unnatural and likely to lead to a disjointed knowledge. Therefore, the first one hundred and seventeen pages of this work are given up to the anatomy of the ear in all its minutiæ. The rest of the five hundred and eighty pages of the book are given up to a consideration of the various diseases of the ear and an excellent index of authors and subjects; the latter comprising about sixteen pages. One hundred and twenty-three pages are given to diseases of the external ear, including those of the membrana tympani. One hundred and fifty-eight pages are devoted to diseases of the middle ear and their treatment.

The rest of the treatise furnishes an interesting consideration of the diseases of the internal ear and auditory nerve, in sixty-two pages.

On page 213 we notice an account of a case of rudimentary auricles and deficient development of the right side of the face and scalp, not found in the first edition of this work. An exploratory operation revealed the fact that the external osseous canal did not exist. The disfiguring projecting auricle was amputated and an artificial one worn in its place. Burns, scalds, frost-bites, and othæmatoma are then considered. In the treatment of the latter, "evacuation of the extravasated blood as quickly as possible, the prevention of a fresh effusion, and the union by adhesion of the separated structures by means of properly adapted pressure," is the course recommended. "The evacuation should be done with a small aspirator. If coagulation has taken place, the clot should be removed through an incision, the depressions of the auricle filled up with cotton-wool, and pressure applied by a suitably arranged bandage, preferably by circular turns over the head." Subsequent management must be in accordance with surgical rules as occasion demands. Massage of the auricle is recommended if there is a tendency to hyperplasia and deformity: by this means the extravasated and inflammatory products are absorbed. Then follows a discussion of herpes, eczema, and various other cutaneous affections of the auricle.

Inflammation of the soft structures of the external auditory canal receives a careful explanation, and here we note new matter on the subject of aspergillus in the ear, not found in the first edition.

In the treatment of boils in the ear, in the early and painful stage, the author employs locally one-sixth grain of liquid extract of opium, and one-twelfth grain of hydrochlorate of morphine, in gelatin ovoid capsules. Before these are applied, the ear is washed out with a warm four per cent. solution of carbolic acid. Sometimes only one application a day is required; in others, three or four. The effect of this treatment is said to be partly anæsthetic and partly antiphlogistic. If pus has formed, this treatment is not as efficacious as before maturation has occurred. "Such good results are obtained from this mode of treatment that the author no longer practises scarification, as was previously done almost without exception in the stage of hyperæmia before the establishment of suppuration." This latter course has been almost entirely abandoned by American aurists, for the last ten years, in treating furuncles in the ear, while, in the hyperæmic stage, emollient instillations have taken its place.

Diffuse inflammation of the skin of the auditory canal receives ample attention. The treatment is similar to that employed in the circumscribed form.

Affections of the membrana tympani receive consideration under the headings Injuries, Myringitis, acute and chronic, and Permanent Apertures, with the application of the artificial drum membrane; and Thickening in all its varied forms.

New formations in the external auditory canal, and foreign bodies in the canal, claim the rest of the part devoted to diseases of the external ear.

Diseases of the middle ear are classified under—(1) Exudative, and (2) Plastic Inflammation of the Middle Ear. In the former the exudative element is predominant; in the latter, the inflammatory new formation. The first class is subdivided into (*a*) catarrhal, (*b*) purulent, (*c*) croupous—croupous exudation on the surface of the mucous membrane, and (*d*) diphtheritic—croupous exudation with interstitial infiltration of the structure.

Catarrh of the middle ear arises either primarily from meteorological or telluric conditions not fully explained, or, as is most common, it originates from a catarrh in a contiguous structure, especially the nasopharynx. It usually occurs on both sides, either simultaneously or at a short interval. If the latter, the left ear is usually first affected and suffers the most. When unilateral, the disease is usually on the left side. Certain diatheses, like struma, syphilis, tubercle, which predispose to affections of the mucous membranes, favor the establishment of catarrh of the middle ear. As is well known, the acute exanthemata contribute largely to this form of ear disease, while typhoid fever, pneumonia, puerperal fever, and inflammations of the buccal mucous membrane, induce their share of aural catarrhs. The symptomatology of this disease of the ear is given most extensively, the author evidently placing great reliance in diagnosis upon auscultation of the ear under the effects of inflation.

Under treatment, after the relief of the more urgent symptoms, pain and deafness, the author dwells very wisely on the condition and treatment of the naso-pharynx. "The use of the vesicants and irritating ointments to the skin in the region of the ear, so much prized by the public, is without any effect in middle-ear catarrh."

Acute purulent inflammation of the middle ear occurs either in an ear previously free from inflammation, or it is developed as an exacerbation of an exciting catarrhal process. It is nearly always unilateral, and is as common on one side as the other. The causes of catarrh of the middle ear may also produce purulent otitis media. In the latter, however, microörganisms appear to play an important part, as in an otitis occurring in pneumonia. Traumatic influences, such as the entrance of fluid through the Eustachian tube in using the nasal douche, favor the development of purulent otitis media. So, also, plugging the nose for epistaxis, from the consequent irritation of the naso-pharynx may induce purulency of the middle ear, as also may the presence of a foreign body in the external ear. Amongst the general diseases productive at times of purulent inflammation of the middle ear, may be named the exanthemata as the most prominent, then tubercle, typhoid fever, recurrent fever, syphilis, puerperal affections, Bright's disease, pneumonia, ulcerative endocarditis, etc. "*Otitis media suppurativa is notably a febrile disease*, unlike the catarrhal affection." In this form of aural inflammation the phenomena, at its outset, relate to disturbances of the nerves of sensation, so that here we find the excruciating and continuous, piercing, and tearing pain in the ear, known as "ear-ache." In children this not uncommonly induces vomiting, or stupor, coma, and muscular spasms, and even epileptiform seizures. The author then considers the treatment of the disease, and also the course it may take if unchecked. The mastoid cells and their outer covering may be attacked, or the disease may invade the cerebral cavity through various natural channels, or anomalous openings in the petrous bone.

In regard to the prognosis of this disease, so far as concerns its inward extension, it is more favorable in childhood and old age than in the intermediate portion of life. This, the author says, is due to the fact that in childhood the sigmoid sinus, through which the morbid process usually passes to the brain, is separated from its mastoid cells by a much thicker barrier of bone than in adult life, and in old age these cells become obliterated by osseous solidification to some extent, and the extension of aural disease to the mastoid and cerebral cavities is rendered less likely. The treatment set forth is most judicious and extensive, planned so as to meet all indications. Of course, the most complete drainage must be maintained. In cleansing a purulent ear, syringing must not be supplanted by mopping with cotton. The author advocates in some cases aspiration of the drum-cavity by means of Siegele's pneumatic speculum, when syringing is not sufficient to cleanse the depths of the cavity. Amongst local applications in otorrhœa finely powdered boric acid is placed in the front rank.

Plastic inflammation of the middle ear, hypertrophic or sclerotic catarrh, is considered rather too briefly for so important an ear disease.

The prognosis is held to be, "upon the whole, unfavorable, especially when the mucous membrane, or the inner wall of the tympanum over the fenestra ovalis and fenestra rotunda, is involved in the process."

The treatment has for its objects the "checking of the morbid process and the relief of the injurious results of the hyperplasia, so far as these may be possible."

It is in this form of chronic catarrh of the middle ear that the aurist encounters the bitter complaints of his patients, of tinnitus aurium, vertigo, and deafness, from the retraction of the membrana tympani and ossicles of hearing, induced by the sclerosis of the mucous covering of the ossicles, and their consequent ankylosis. The author offers, practically, very little for their relief, and we are amazed to find no allusion to the good results obtained by others in just such cases, by excision of the stiffened membrana tympani and ossicles. In some instances entire relief from tinnitus and vertigo has been afforded by this operation when *all* other means have failed. But, the author appears ignorant of what has been thus accomplished by others.

The author advocates, however, tenotomy of the tensor tympani, if it appears that retraction of that muscle is the cause of tinnitus and vertigo. He regards tenotomy of the stapedius muscle as a doubtful remedy for relief of diminished mobility of the stapes. The treatment of polypus from the ear is based upon the two cardinal principles common to all surgical practice, viz.: the removal of the new-growth, and the prevention of a recurrence.

Inflammation of the periosteum of the mastoid region receives a short chapter, in which it is considered under two forms, the primary and secondary. The first is of very rare occurrence; the second is very frequent in connection with inflammatory processes of the aural structures. Caries and necrosis of the temporal bone and of the auditory ossicles receive attention in a chapter of twenty pages, but the treatment seems to us very meagre and inadequate, though the description of the diseases and symptoms is most complete, and to an aurist very interesting. We have again to comment on the silence of the author upon excision of the diseased membrana and necrosed ossicles in chronic purulency, and the great advantages gained thereby.

The truth is, the operation of excision is so painful that it demands etherization of the patient. But, unless his ear is then illuminated by an electric head-lamp, devised for the purpose, the operation cannot be safely carried out; and, so far as we are aware, the only thoroughly useful electric lamp for this purpose is of American make, and, apparently, has not yet been imported into Germany.

Time and space cannot be given here to as long a consideration of diseases of the internal ear and auditory nerve as they deserve. Though Ménière's disease is still so called, a name which we hope to see supplanted some day by the just title of aural vertigo, we are glad to note that the author mentions the fact that even Ménière did not claim that this disease is necessarily always due to primary changes in the semicircular canals, "but that pathological processes in the middle ear, so far as they are capable of injurious influence upon the labyrinth, may likewise evoke phenomena of this order."

The entire treatise of Gruber impresses one as the work of a man imbued with a profound scientific spirit, even if some of the treatment is rather too conservative and antiquated. His translators have done their work into acceptable English, and the publisher has given the reader a book attractive in every way. C. H. B.

TRAITÉ DE GYNÉCOLOGIE CLINIQUE ET OPERATOIRE. Par S. POZZI, Professeur agrégé à Faculté de Médecine, Chirurgien de l'Hôpital Loureine-Pascal. Pp. xxiv., 1154. Paris, 1890.

A TREATISE UPON CLINICAL AND OPERATIVE GYNECOLOGY. By S. POZZI, M.D., etc. Paris, 1890.

WE are not aware of any more scholarly, comprehensive, or intelligible treatise upon gynæcology in the history of its literature. Gynecology is a subject which has developed so rapidly, and in so many directions, that to attempt to write a record of this progress, and at the same time accumulate a large individual experience, is a task which few men in the future will attempt. Monographs, and series of lectures, and encyclopædias, will probably form the future literature of this subject. The tendency of gynecology at the present time is mainly surgical. This tendency is well marked in the work under consideration. If it had introduced propositions which seem audacious to those who believe that very many of the ills peculiar to women can be cured by drugs, its defence is logical that there will be a great saving of time in some cases, that life itself will be saved in others, and that if surgery fails other means may still be resorted to. Of course, it is admitted that the so-called risks of surgical measures are often greater than those of medical ones, but it is assumed that the gains will also be greater.

The author states that his experience and observation have not been limited to his own country. This is obvious from the enormous mass of literature, foreign as well as home, to which he refers, and with a fairness and frankness which are quite too infrequent among French and German authors. It is a great satisfaction to find a Continental author who is free from that narrowness and provincialism which sees no virtue beyond the border-lines of its own territory. There is but one subject in the wide range of gynecology, so far as we can recall, which the author has not touched and illuminated, with that clearness of expression for which the French language and manner of thought are so well adapted. That subject is the diseases of the mammary glands, which are as essential a portion of the reproductive apparatus in woman as the organs of the pelvis. They certainly are as deserving of attention by systematic writers as the diseases and injuries of the bladder, and no one should think of writing a treatise on gynecology and omitting them. The work abounds in plates and figures, many of which are peculiar to it, and are well executed, and clear in their teaching. The value of good plates cannot be overestimated in such a work. The pathology is written, of course, from a French and not a German standpoint, and the two do not always harmonize. The views of German pathologists are referred to, however, without apparent prejudice.

One fact, which must have been remarked by any thoughtful gynecologist, is the diminished importance which uterine displacements *per se* have occupied in pelvic pathology within the past five years; or, perhaps, it would be better to say that the method of treating them has changed, and is still in process of evolution. This fact is manifested in the diminished space, relative to similar works of equal magnitude, which the author gives to the classification and treatment of these disorders, especially their treatment by pessaries. The pessary seldom cures, and is often a great nuisance. At present there seems to be no alternative to such treatment but cutting operations. Of these there is a sufficient variety, but their very abundance is sometimes an embarrassment, and not one of them can be relied upon to give uniformly good results. Some of them need only be mentioned to call forth insuperable objections. It would seem unnecessary to comment in detail upon the numerous excellences of the work. There is a notable and refreshing absence of excessive refinement in classification, which, with most minds, tends to confusion. The subject of pelvic inflammation, that old bugbear, is intelligently discussed in the light of modern, that is, recent surgical experience, and while this method does not give us all needed information, it is better than the method of the deadhouse alone, or the method of palpation. In connection with this subject we observe one statement with which we cannot agree, namely, that ovaritis cannot exist without an antecedent endometritis and salpingitis; that is, that we have no simple lesion *ovaritis*, but always a mixed one, *tubo-ovaritis*. Now, we believe it is not very unusual for ovaritis to exist alone, especially in connection with disturbances of the utero-ovarian bloodvessels. This may or may not be connected with menstruation and menstrual disorders, and this statement is made, not as a matter of theory, but of experience. A criticism of the arrangement of subjects in this work would be but an expression of opinion. We confess a preference for such an arrangement as is found in Thomas, and some other works of equally high degree of excellence, fundamental considerations of anatomy and pathology taking the lead, and consideration of parts and organs, from without inward, following. Such an arrangement seems to us the natural one, and obviates repetition, at least to a considerable degree. But failure to follow such a plan is a minor defect, if, indeed, it is a defect. On the whole, the work is, as we stated at the beginning, a very meritorious one, and highly creditable to its distinguished author.

A. F. C.

A PRACTICAL TREATISE ON IMPOTENCE, STERILITY, AND ALLIED DISORDERS OF THE MALE SEXUAL ORGANS. By SAMUEL W. GROSS, A.M., M.D., LL.D., Professor of the Principles of Surgery and Clinical Surgery in the Jefferson Medical College of Philadelphia, etc. Fourth edition. Revised by F. R. STURGIS, M.D. Pp. 169. Philadelphia: Lea Brothers & Co., 1890.

A TREATISE which, after achieving three issues from the press, and a translation into the Russian tongue, appears in a fourth edition after revision, is certainly entitled to respect, and, in a qualified sense, to some concession of authority. The several pages of this small work are fairly well known to the profession at large, and scarcely call for further extended notice. The several chapters on atonic, psychical, and symptomatic impotence, have been made familiar, not merely to the practitioner and student, but to not a few of the anxious among the profane.

Sterility, spermatorrhœa, and prostatorrhœa, as here expounded, are the data of andrology for some who are not merely of the initiated, but of the curious. Much that is here set down is clearly expressed, based upon creditable observation and authority, and illustrated by trustworthy clinical fact. Some of the injunctions are wise, and of practical worth. The book itself represents no light labor of collation and an abundant experience.

None the less, one can scarcely read a half-dozen of its pages without being convinced that the mental vision of the lamented author was unfortunately distorted by certain obstinate opacities that lay in its field. He honestly believed and taught that the practice of masturbation, not in a few isolated and singular instances, but in many, if not the majority, of its youthful victims, was effective in the production of stricture of the urethra. Acting upon this conviction, he explored, distended, divided, and otherwise treated the urethræ of a large number of young men who had never contracted a blennorrhagia, but whose troubles he thought sprang from local mischief in these parts. Impressed with this conviction, not shared by the greater number of authors upon this subject, he wrote the treatise before us.

In describing atonic impotence (Cases I.—V., p. 24), he recognizes a "stricture" in each of five young men, "in whom the idea of gonorrhœa must be discarded." In treating of organic aspermatism, he cites the case of a man with no history of gonorrhœa, in whose urethra he found a "stricture" (Case XXVI., p. 119). In describing atonic aspermatism, he relates the case of a man suffering from "stricture," who gives no history of gonorrhœa (Case XXIX., p. 123). In connection with the subject of nocturnal pollutions he relates the case of an adult male, virgin of all sexual indulgence, affected with a "stricture" (Case XXXI., p. 134). In discussing diurnal pollutions he relates the case of a patient, no gonorrhœal antecedents recorded, affected with a "stricture" (Case XXIV., p. 137). In the pages devoted to prostatorrhœa, "in its pure form," as displayed in twenty-one subjects, he states that, of these, nineteen had "stricture of the urethra" (p. 162).

It is as impossible for one to read these pages and accept their deductions, without questioning their premises, as it was for the author himself to put his thoughts on paper before they had been filtered through and colored by his unfortunate convictions.

The reviser of the present edition is quite competent to view these subjects with an unprejudiced eye, and to write upon them with clearness, vigor, and authority. But, in the present case, he has contented himself with the expression of his personal dissent or correction in the compass of paragraphs which appear scattered here and there along the pages, as they seemed to him to be required. The first emphasizes the propriety of a divorce between impotence and sterility, and is soon followed by another (p. 22), denying that confirmed masturbation and gleet are equally sure to result in stricture, with a suggestive hint that the arrest of a bulbous bougie, "even of small size," when traversing the urethra, is not evidence of a "true stricture." In this way, as page succeeds page, he amends or adds to the conclusions of the text. The result as a whole is unsatisfactory and feeble. The revision would have been far more acceptable to both the reviser and his readers if Dr. Sturgis had rewritten the entire book.

It is scarcely within the province of the reviewer to suggest to authors and editors how to deliver themselves acceptably on any theme, and yet Macaulay, one of the ablest of reviewers, did not hesitate in such a course. If one were ever tempted to follow such bold steps it might be in connection with a subject that is an ancient accretion of prejudice, lust, greed, fear, and ignorance. And yet it is a subject which should be approached by an author, as the sunshine falls upon a heap of ordure, in a spirit of sympathy, fearlessness, candor, sincerity, and truth. Surely he should devote some space to the physiology of the male sexual organs, not merely in their narrow functions, but in their broader relationship to the general economy, to the product of conception, and, both as to their activities and anatomical details, to the not dissimilar organs of the other sex. He should set in evidence the incontrovertible fact that the generative apparatus of the male, after half a century of complete disuse, may be capable of procreation, as also the equally established fact that it may accomplish the same end after a similar lapse of time in the face of the most persistent and frightful abuse. The wonderfully planned conservation of its power, under the jealous protectorate of the recuperative energy of the body, in both health and disease, in precocious development and tardy decline, should be well understood by him who resorts to a therapeutic measure or a surgical mutilation. With this it should be demonstrated clearly that the procreative is far from holding the preëminent place among the powers of the body, being often preserved in the fullest measure by the tuberculous, the syphilitic, and the idiotic; that it is often most successfully active in those periods of human life when the best powers of a man are actually immature; and that it may be wholly wanting, or but very feebly developed, in individuals who physically represent the grandest and noblest types of the sex. He should be able to prove rigorously that the words "potent" and "impotent," in the sense of their common usage, have no meaning whatever for the expert, and express chiefly the erroneous concepts of those who employ them, the majority of healthy men being both potent and impotent in this false sense; and, given a fixed moment and certain conditions, the average man will be "potent" or impotent, according as a thousand factors may operate in the one direction or the other. He should show that the human like the other animal brutes (as, for example, in the type of the North American savage), may, indeed, at all times be competent to effect a rape at will, but that the "civilized" man, even when governed by immoderate lust, and possessed of unusual vigor, is often "impotent" in conditions of health. He should be able to demonstrate that there is a prostatic no less than a uterine "flood and ebb," in each month, of sexual congestion and its reverse, and point out the fact that as women are distinguished from the females of all other animals (in generations of transmitted inheritance), by a menstruation which may be described as the price of virginity and chastity, so the "spermatorrhœa" of the male may be a condition of his clean living; and that even when his losses at night occur "without erections and dreams," he is in no danger of touching that "pathological" state described by our author (without correction) in the revised edition before us (p. 135).

With these and other allied facts fully explained, the reader of a text-book would be in position to begin, without prejudice, the study of the perversions and partial or total suspension of the sexual power in men who have never had a stricture of the urethra. Yet, even here, he should be led, further, to the far more interesting field where accurately localized organic changes in the sexual tract are responsible for such results, the changes themselves being, however, as a rule, of far more consequence in many ways than in relation merely to the minor consequence of "impotence" or "sterility." Tuberculosis of these organs, for example, is a subject of vast importance, our knowledge of it increasing with every month, under the impulse of the painstaking efforts of indefatigable research. It probably, even when most insidious of evolution, first attacks the prostate gland, and many of the poorly described diseases of the prostate in persons virgin of venereal antecedents are instances of its interference with the functions of that organ. Yet, in the present treatise, no attention is given to its influence in discussing the etiology of spermatorrhœa (the word "tuberculosis" does not appear in the index), though there are few experts who have not examined cases of genuine spermatorrhœa, where semen was regularly at certain hours of the day discharged with the urine, and where the whole mischief originated in a tuberculosis of the gland in question. In this same field of organic changes, again, one seeks to know more of the abnormal condition, known as "bloody semen," than can be compressed into the scanty paragraphs here devoted to the subject. One would like to know how to differentiate the bloody semen of prostatic origin from the more obstinate form due to blennorrhagic involvement of the seminal vesicles, and even to understand how to discover which vesicle is at fault, as well as to be fully instructed that even in the most obstinate cases this condition can be made to yield to that wherein a child may be procreated by the subject of the disease.

We look, indeed, to have a fuller and more useful edition of this treatise from the hand of the present reviser at no distant day—one that can be commended as worthy of the study of the practitioner who, if truth must be told, is too often so poorly informed of the diseases of his own sex that he can for the most part describe with greater accuracy those of women.

The publishers have done their part with unusual care, the proofreading being remarkably accurate, and the typography all that can be desired. J. N. H.

DU VERTIGE CARDIO-VASCULAIRE, OU VERTIGE DES ARTERIO-SCLEREUX, PAR LE PROFESSEUR J. GRASSET: Leçons Recueilles et Publiées par le DR. G. RAUZIER, Chef de Clinique Médicale. Montpellier: Camille Coulet, Libraire-éditeur. Paris: George Masson, Libraire-éditeur, 1890.

ON CARDIO-VASCULAR VERTIGO, OR VERTIGO OF ARTERIO-SCLEROSIS. By PROFESSOR J. GRASSET. Reported by DR. G. RAUZIER, Chief of the Medical Clinic. 8vo., pp. 80. Montpellier and Paris, 1890.

THIS is quite a careful study of an important subject, and is enriched with some valuable sphygmographic tracings. The author believes that all species of vertigo should be grouped under two grand divisions: First, acute, or accidental vertigo, which may depend upon a great variety of causes; second, chronic, or habitual vertigo, which is of much more importance. Three divisions of chronic vertigo are commonly recognized: first, epileptic vertigo; second, sensorial vertigo, and especially auricular vertigo (Ménière's disease); and third, gastric vertigo. To these the author, following Huchard, would add cardiovascular vertigo, or the vertigo of arterial sclerosis, which he believes has not received proper recognition from clinicians in general.

Arterial sclerosis, he says, is a general and chronic disease of the entire arterial system, which, while it affects the whole of that system, may present more marked localization in different organs. Arteriosclerosis is not to be identified with atheroma, the latter being but one of its manifestations, just as others are to be found in Bright's disease and cerebral softening.

Among the causes of arterial sclerosis, he enumerates chronic rheumatism, gout, diabetes, asthma, migraine, lithiasis, obesity, and other disturbances of innervation and nutrition, alcoholism, lead-poisoning, tobacco-poisoning, impaludism, syphilis, and infectious maladies in general. As a rule, he thinks that no one of these causes alone produces it, but that it is the resultant of several coöperating chronic intoxications. He endorses the theory of Huchard, that the arteritis, which is the anatomical basis of arterial sclerosis, results from inflammation consequent upon repeated spasms of the arterioles due to the irritation of toxic agents circulating in the blood. The particular effect of these spasms is a condition of hyper-tension of the arteries, which thus becomes of importance as an early diagnostic indication. The most important physical sign of this condition is the accentuation of the diastolic or closure sound in the aortic region. Among the important symptoms to which it gives rise is vertigo, the character of which varies with the localization of the lesion in the nervous system. We have simple vertigo, vertigo with epileptiform crises, or vertigo with permanently slow pulse, associated with epileptiform attacks or with frequent syncope. In particular the latter form, ascribed by Charcot and his pupils to bulbar lesion, the author, following Huchard, insists upon as a symptom of arterio-sclerosis, with, perhaps, special localization of lesions, both in the heart and in the medulla.

In treatment, two agents are especially applicable—sodium iodide and trinitrin (nitroglycerin); the indications for which are self-evident. When epileptiform crises accompany the vertigo, sodium bromide may be added to the treatment; and when nutrition is specially at fault, sodium arseniate is advised.

With the etiologic, pathologic, diagnostic, and therapeutic observations and arguments here advanced, the profession in America has for some time been familiar through the teachings of Bartholow.

S. S. C.

PROGRESS

OF

MEDICAL SCIENCE.

THERAPEUTICS.

UNDER THE CHARGE OF

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Hints on Dietetics.

Sir William Roberts, who has devoted much attention to the subject of dietetics, has recently read before the Manchester Medical Society a communication on this subject.

He considers that the dietetic customs of civilized races suggest two distinct indications—one to subserve the needs of general nutrition, the other to subserve the needs of the higher functions of the brain and nervous system. It may be said that bread and other cereal articles, leguminous seeds, the various products of the dairy, fruits and vegetables, the harvest of the sea, and meat are designed to minister to the former purpose; and that tea, coffee, and the various forms of alcoholic beverages are designed to minister to the latter purpose. With this second group should also be classed tobacco; for, although tobacco cannot be regarded as a food, its use must be ranked with our dietetic customs. Strictly speaking meat, or at least some kinds of meat, should probably find a place in both categories, for it possesses certain stimulating properties which distinguish it from vegetable and dairy products. Tea and coffee and alcoholic beverages are sometimes branded as luxuries. What is a luxury? You cannot rightly class as luxuries—meaning thereby something that has no solid utility to the species—articles that are in general use among a successful and ascendant community. The very fact that they have attained this position is, to a naturalist, evidence sufficient that in some way or other the community as a whole, and in the long run, benefits by their use. The struggle for existence—or, rather, for a higher and better existence—among civilized men is almost exclusively a brain struggle; and these brain foods, as they have not inappropriately been termed, must be regarded as a very important part of the equipment for that struggle. One of the most characteristic features of our dietary is its variety or diversity. Not only are our several daily meals framed on a different plan, but the meals of one day differ more or less from the corresponding meals of another day. We may be quite sure that this diversity serves some useful end. In drawing up schemes of diet we are not, therefore, justified in neglecting this feature and in reducing the diet-list to a dead level of monotonous uniformity. A want of attention to this point leads us unwittingly to needlessly torment and worry our patients by placing unnecessary restrictions on their choice of food. Some of those commonly imposed are difficult to understand. Most of them probably derive their origin from some crude notions floating through the lay press and unconsciously lodged in the medical mind. Why, for example, should tea and coffee be so frequently forbidden without any evidence that they disagree with the patient? or why should the bland, innocuous, and easily-digested potato be so ruthlessly proscribed? Sometimes prohibition takes a wider sweep, and fruit and vegetables are included in one general condemnation, nor are the rules laid down always self-consistent.

A good rule is to say to the patient, "Do you like it?" "Does it agree with you?" If the answer is in the affirmative there is no intelligible reason why the use of that article should not be sanctioned. Such a rule is so plain and simple, and so obviously consonant with good sense that it might scarcely appear worth while, or even dignified, to make formal mention of it, were it not so well established in the experience of all that it is constantly violated. The patient's instinct represents an immense accumulation of experience, partly acquired and partly inherited. It is, of course, not infallible—no instinct is; but so close and true are the sympathies of the palate with the stomach and the rest of the organism that its dictates are entitled to the utmost deference as those of the rightful authority in the choice of food.

A change of diet may often be of advantage to the patient. A course of two or three weeks of vegetarian regimen occasionally proves most grateful, especially in the case of heavy feeders. Similarly, the total abstinence from alcoholic beverages is often highly salutary, and most of all for those whose daily potations are on a liberal scale. Slight variations in the diet are often of advantage; thus, changes from tea to coffee or cocoa, from one kind of alcoholic beverage to another, from one sort of bread to another.

A change in the times of the meals is sometimes of benefit. In some cases troublesome insomnia may be relieved by changing from mid-day dinner to late dinner or substantial supper. Such effects are merely temporary, and their benefits are exhausted within a month or so, and then a return to the old diet or a new change may be desirable. A point of practical importance is that when certain articles disagree, it is better to lessen the quantity than to forbid; if fruit or vegetables prove difficult of digestion, it is unwise to prohibit them altogether. The antiscorbutic properties of fruit and vegetables cannot be safely foregone, and a very small proportion suffices to fulfil this indication. As regards potatoes, people do, no doubt, stuff their stomachs with potatoes, which the organ finds it difficult to deal with. But many persons cannot enjoy, or scarcely eat, their dinners without potatoes, and to abstain from them is a great privation. Nor is this necessary: a reduced allowance will solve the difficulty perfectly. Then, some persons are abnormally sensitive to tea or coffee or alcoholic beverages, and suffer discomfort from the quantities usually taken. But abnormal sensitiveness is not a proof that the incriminated article is unserviceable, and a diminution of the quantity may prove a better remedy than total prohibition.

Finally, Dr. Roberts adverts to the necessity for revision of the diet to meet those changes in the type of nutrition which naturally takes place as the individual travels on from youth to age. In the normal course the palate and the appetite adjust themselves automatically to these altered conditions, and there is a lessened intake of food, but sometimes these adjustments lag behind, and the power of taking food remains unaltered, while the assimilative powers are on the wane. Then some form of nutritive disorder necessarily follows. In most of these cases, but not in all, there is a tendency to stoutness. There are indications of digestive difficulties and of engorgement of the abdominal organs, and signs of that vague condition termed latent or undeveloped gout. The early recognition of this condition is very important, for thereupon depends the prevention or postponement of degenerative processes which hereafter prove formidable. In this conjuncture the observant medical adviser may render invaluable services in detecting the maladjustment and in taking timely steps for its correction. The most obvious indication is to lessen the quantity of food, and where difficulty is found in controlling the actual amount of food taken, where the appetite is yet strong and the powers of gastric digestion are abnormally active, the less concentrated forms of food are here a useful resource—green vegetables, salads, and thin soups—which help to fill the aching void without adding materially to the albuminoid and fatty ingredients of the meal. Tea and coffee are also serviceable in allaying an unseasonable craving for food. A stiff cup of tea or coffee shortly before dinner certainly takes the edge off a troublesome appetite. It is, however, well to proceed cautiously in this direction, for the promptings of nature are not to be lightly set aside. The effects of a contracted diet should be carefully and patiently watched with an open mind for every sign or suggestion, whether of warning to retreat, or of encouragement to advance. In middle life particular attention should be paid to the quantity of alcoholic beverages; as a very general rule, the tolerance for these articles diminishes with advancing years, and it is necessary nearly always with persons who have used them freely to reduce their quantity when middle age is reached. In regulating the diet of substantially healthy persons, it is imperative to beware of hard-and-fast lines. Cases of this group are very diverse; scarcely any two are exactly alike, and their management is complicated often by social considerations which are difficult to justly estimate. We can only hope to avoid serious errors by a patient investigation of each particular case, and by bringing to bear upon it a full knowledge, combined with a large infusion of common sense.

These suggestions apply to cases where the patient is only troubled with some slighter ailment or indisposition which does not incapacitate him from taking his part in the world's work, nor necessitate any great deviation from his usual habits. In regard to the dietetic management of a case of fever, or of diabetes, or of gastric ulcer, or, indeed, of any of the more serious forms of sickness, medical men are of, in general, one opinion; but in persons in the main healthy, the advice tendered by different practitioners is apt to show a lamentable want of consonance, or even total contradiction.—*Therapeutic Gazette*, No. 1, 1891.

Treatment of Internal Hæmorrhage.

Dr John Ferguson has given a very good outline of some of the ways in which a practitioner may render aid to his patients in this emergency.

Among the remote ways of treating internal hæmorrhage are lowering the blood-pressure and changing the character of the blood itself. It is very apparent that the amount of blood that will flow through a rent in the wall of any vessel must be greatly influenced by the total amount of blood in the system and the amount of pressure upon the vessel from within. This being the case, the first step to take in dealing with a hæmorrhage is to cut off the supply of liquids. In this way the amount of blood is kept down, while it becomes thicker and better fitted for forming a good firm clot in the torn or ruptured vessel. Another step in the same direction is to reduce the volume of blood by actively eliminating water from the system. The hypodermic injection of pilocarpine rapidly unloads the body of water and inspissates the blood left behind, lessening thereby the freeness of the flow. This would not, however, be suitable in cases of pulmonary bleeding. Other diaphoretics might be selected, according to the judgment of the physician.

Those purgatives that produce copious watery stools, and at the same time are not irritating or depressing, must be placed high on the list of agents we may use for the relief of the sufferer entrusted to our charge. Of these purgatives there is none so good as Epsom salts. When given in saturated solution, without water, in free doses and often repeated, very free watery evacuations are produced, the amount of fluid in the vascular system is speedily lessened, and the hæmorrhage to this extent controlled. By maintaining this action for some time, the ruptured vessel has time to heal, because the pressure is largely taken off and it is put into the condition of rest. In addition to this the blood is thickened. In some cases of cholera—sporadic or epidemic—when the rice-water stools have been very abundant, the blood becomes so reduced in volume and so inspissated as not to flow from a wound made in a large vein. In the event of hæmorrhage due to ulceration in typhoid fever, this plan could not be had recourse to, though it might be used with advantage in the bleeding from a gastric ulcer. In the hæmorrhage, often so free, from soft and rapidly-growing uterine fibroids, it is specially useful if continued long enough—say for months.

In severe post-partum hæmorrhage the medical attendant may try ergotin hypodermically, or hot vaginal or rectal injections, but these may fail. It is a belief, not yet quite dead, that the uterine sinuses are closed by clots. This is quite erroneous. The uterine vessels and sinuses are interlaced by muscular fibres, and it is the contraction of these that arrests the hæmorrhage. This muscular tissue, as it were, ligates the vessels that would bleed, and, so long as the contraction is good, there is no danger. For the maintenance of this tonic action of the muscular tissue in the uterus the application of heat to the lumbar portion of the spine has been found very useful. It stimulates this portion of the nervous system by bringing more blood to it. There is a greater influx of nerve-energy to the uterus and contraction is brought about. It is true that the uterus seems to be very independent of the spinal cord, and labor may take place in a paraplegia. This does not, however, invalidate the fact that heat—applied to the spine by a sponge dipped into hot water—does much good in the way of rousing the uterus into action. But when all things fail, as a last resort we may tampon the uterus and vagina thoroughly with iodoform gauze, or, if this is not at hand, some cloths to which glycerin is added. The bleeding is soon arrested, the uterus begins to contract, tone in its walls is secured, and one can feel at ease that the patient is out of all immediate danger.

In capital operations, such as the removal of large and vascular tumors from the neck, the female breast, etc., the plan is simply to tie bands around the legs and arms close up to the body. This arrests the return of blood to the body, while the flow of blood into the limbs still goes on. By this means a very large amount of blood in the body is rapidly collected into the four extremities and the pressure is taken off the central vessels. This method gives time for the use of other means.—*New York Medical Record*, December 1, 1890.

A Case of Severe Acute Anæmia Cured by Salt-water Injections into the Rectum.

In a case of enormous hæmorrhage during a severe long-continued labor, in which the placenta was too early detached, Drs. Herr and Haussmann used the treatment advised a short time ago by Gill for preventing death by hæmorrhage.

Mrs. S., aged thirty-seven years, rhachitic in her youth, had at the time a contracted pelvis (true conjugate 8 to 9 cm.). Since 1882 she had five dead children, with very difficult labors.

At the beginning of the labor under discussion, severe hæmorrhage occurred, for which Dr. Heer was quickly summoned. Under the most difficult complications and continuous hæmorrhage, version and extraction were accomplished. This time also a dead child was delivered (impaction of head at promontory).

After the birth the mother's pulse was barely perceptible. In spite of repeated subcutaneous injections of camphor, ether, and internal stimulants, together with powerful massage of the uterus, over which considerable time was consumed, the patient sank into a complete anæmic, bloodless condition. The pulse was imperceptible, the superficial veins of the arm were empty and could not be distinguished. On this account and because there was no time to lose, neither transfusion or subcutaneous injection was practicable, but especially on account of the rapidity and ease of its administration the rectal injection of a solution of one-half per cent. lukewarm salt water was employed. About two quarts of the fluid were introduced, which was quickly absorbed. During the injection the patient's pelvis was raised.

Later a syncope occurred again with vomiting, pulse absolutely imperceptible, temperature subnormal. Therefore another salt-water injection was made into the rectum, which was retained. Soon after the radial pulse could be felt feebly. The following morning the general condition was improved, pulse somewhat stronger, 129 to 140 a minute, temperature 99.5° F. After the control of the anæmia the convalescence progressed rapidly.

So simple a life-saving method is at least worthy of a trial by clinical instructors and practitioners.—*Centralblatt f. Gesammte Therapie*, Heft v., 1890.

Quinine in Typhoid Fever.

Many physicians still prescribe quinine in typhoid fever by giving 15 to 30 grains in four doses, to be taken during the day. In this manner no therapeutical result is obtained, because it is seldom that a reduction of temperature follows.

Although, according to Dr. Manassein's observations, quinine is retained longer in the system of a fever patient than in health, it is a well-known fact that quinine begins to be eliminated by the kidneys after ten minutes, that after twelve hours the whole dose is secreted and eliminated, and that elimination is greatest after six hours from the time the drug is taken. Therefore, small doses cannot have any effect.

In typhoid fever it is advisable to give large doses at short intervals, viz., 20 to 30 grains in one hour. To overcome the pyrexia it is necessary to administer the drug six or eight hours before the rise of temperature, viz., 8 to 15 grains at ten o'clock and 15 grains at eleven o'clock in the morning.

Dr. Huchard found the combination of quinine and antipyrine very useful in the following proportion: hydrobromate of quinine and antipyrine of each 75 grains; to be divided into ten doses, two doses to be taken during the day.—*Centralblatt f. Gesammte Therapie*, Heft v., 1890.

Boric Acid in Constipation.

Herr Flatau has suggested to the Medical Society of Berlin the use of boric acid in chronic constipation. In cases where the lower part of the rectum protrudes through the anus, and remains visible after powerful contractions of the levator ani and sphincters, the quantity of forty-five grains of boric acid is either dusted or rubbed on the mucous membrane in sight. In cases in which the mucous membrane is not visible it must be insufflated. It is important that the medical attendant should carry out the procedure himself, at any rate at the commencement. The patient should then keep quiet for a time. In from an hour to three hours peristaltic action will be observed in the colon. He has never seen a failure from this method of treatment, nor has he seen a case where the patient got so accustomed to it that it ceased to be effective. On the contrary, if carried out systematically daily, permanent improvement in time takes place, and normal peristalsis is secured.—*Medical Press and Circular*, 1890.

Chloral-antipyrine.

Hydrate of chloral combines with antipyrine to form two definite compounds, one containing a molecule of chloral hydrate and one of antipyrine—monochloral hydrate; the other containing two molecules of chloral and one of antipyrine—bichloral antipyrine. Professor Lee has found that in their physiological action they are both like chloral, but differ from it in having a less depressing action upon the circulation.

In doses of thirty to forty-five grains they are comparable to chloral as hypnotics. Compared with sulphonal and chloralamide and chloralimide, the compounds of chloral and antipyrine are less certain in their hypnotic action.—*La Médecine Moderne*, No. 52, 1890.

CHRYSAROBIN IN PSORIASIS.

DR. UNNA recommends

Chrysarobin	5	parts.
Salicylic acid	2	"
Ichthyol	5	"
Vaseline	88	"

Made into an ointment and to be rubbed into the affected parts.—*Nouveaux Remèdes*, No. 23, 1890.

CAMPHORIC ACID IN CYSTITIS AND FOR THE NIGHT-SWEATS OF PHTHISIS.

Of a twenty per cent. solution of camphoric acid in alcohol	10	parts.
Water	400	"

To be used to wash out the bladder, twice a day.

It will stop the decomposition of the urine, but has no influence on the secretion of pus.

For the night-sweats of phthisis three doses of fifteen grains each may be taken during the day, or forty-five grains on retiring.—*Nouveaux Remèdes*, No. 23, 1890.

TREATMENT OF SCABIES WITH CREOLIN.

HYDRATE OF AMYL IN EPILEPSY.

As suggested by Wildermuth, DR. UMPHENBACH tried amylhydrate with seven patients who had suffered from epilepsy for many years. The ages of the patients were from twenty to fifty-five years, and the dose given was one drachm and a quarter to two drachms pro die.

Dr. Umphenbach has not observed particularly favorable results from its use.

Two patients who on an average had had nine and eleven attacks a month, had no attack while taking amylhydrate.

The third patient was helped by the remedy at the beginning. He passed the first month without any attack, while formerly he had had thirteen, but on further trial the remedy failed. The patient had as many or more attacks than before.

With the other four amylhydrate did not markedly affect the number of attacks. The remedy was well taken by the patients, but produced in nearly all of them a great tendency to sleep. Their appetite was unimpaired.

On the other hand the remedy had almost always the disadvantage that after its discontinuance sleep was disturbed for a long time, and patients who had formerly been quiet at night became restless. It happened in three cases that a number of days after suspending the use of the remedy the patients were confused even without having an epileptic attack.

Patients thus affected had suffered before, but it was evident that the confusion caused by suspending the use of amylhydrate lasted much longer. The confusion was also observed when the dose was gradually diminished.

It seems very remarkable that in several patients, who had had before only one or two attacks a day, had after suspending the remedy a series of attacks.

Among these was an imbecile fifty-five years old, who from his earliest youth had suffered from epilepsy, and who in recent years had an average of nine to ten attacks every month without any especial excitement or confusion. Under treatment with amylhydrate the number of attacks was diminished to eight a month. When the administration of the remedy was suspended nine attacks occurred daily during the next six days and the patient died during the last.

The autopsy indicated nothing special except a very marked hyperæmia of the brain.

It may be mentioned that in two patients who had been under treatment by amylhydrate the attacks remained less severe. These were patients who before had had pronounced epileptic convulsions.

The number of Dr. Umphenbach's experiments is small, but the result

one. Among the factors which have to do with the production of hæmorrhoids, and each one of which should be considered in the treatment, there are many. The valveless condition of the portal veins, gravitation, obstruction owing to hepatic disease, obstruction from hepatic, cardiac, or pulmonary disease, sedentary habits, excessive eating and drinking, excessive obesity, too frequent use of purgatives.

For successful treatment, the patient should have a daily movement of the bowels regularly. Sponging the anus and surrounding parts with soap and cold water, is a very efficient application, thus removing acrid fluids which, during the ensuing day, would irritate the skin. A larger proportion of vegetable diet, and a smaller proportion of meat. Cases of hæmorrhoids with constipation may sometimes be cured by attention to this alone. Sufficient exercise is of much importance. Some patients may obtain relief from a daily injection of as much water as can be retained for four or five minutes with comfort. Lukewarm water may be recommended at first, but as soon as the patients can bear it, cold may be ordered. Those who suffer from hæmorrhoids should, if possible, give up taking stimulants entirely.—*Lancet*, No. 5, 1891.

MEDICINE.

UNDER THE CHARGE OF

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The Pathology and Diagnosis of Pediculated and Globular Cardiac Thrombi.

Ziemssen (*Fortsch. d. Med.*, 1890, 8, 959) adds another instance to the (as he says) five cases of globular thrombi described in medical literature. He describes two instances of large pediculated cardiac polypi of the left auricle, which, he says, produced the same symptoms as the globular thrombi. Basing his opinions upon these three cases, together with cases already described by Hertz, he believes that a probable diagnosis can be made under the following conditions, namely: 1. The presence of a mitral stenosis. 2. The evidence of very great obstruction to the flow of blood in the left chambers of the heart, greater than is wont to occur in the case of simple mitral stenosis. Cyanosis and dyspnœa are, too, unusually intense, and the filling of the arteries extremely meagre, so that the nourishment of the parts of the body furthest removed from the heart is so slight that gangrene may develop. The last symptom was witnessed in all three of the author's cases, and in one of Hertz's.

[Ziemssen has evidently overlooked the case described by Osler (*Johns Hopkins Hosp. Rep.*, ii. 1, 1890) in which a freely movable, round elastic thrombus, the size of a walnut, lay in the left auricle above the much-narrowed mitral orifice. The thrombus had given rise during life to no special clinical symptoms.—Ed.]

Poliomyelitis and Polyneuritis.

Blocq and Marinesco (*Nouvelle Iconographie de la Saltpêtrière*) publish a valuable and well-illustrated contribution upon this subject. The existence of infantile acute poliomyelitis is undoubted; that of acute, sub-acute, and chronic poliomyelitis in the adult has, however, been questioned. The authors quote four cases with autopsies from the literature—of which they have made a careful review—as well as one not previously reported, which prove that all three adult forms do exist. They also report a case in detail which presented symptoms analogous to those of acute poliomyelitis, though there were certain psychic symptoms attending them, but which the autopsy showed to be an instance of polyneuritis. The case was very interesting, particularly on this latter account, and approached in its symptomatology a group of cases described by Korsakoff as "psychic, toxæmic cerebropathy," or "polyneuritic psychosis."

As a result of their studies the authors draw the following conclusions:

1. There exist certain morbid conditions which exactly correspond from a

clinical point of view to the disease described by Duchenne under the name of acute and subacute anterior spinal paralysis of the adult, and which are, in fact, dependent upon lesions of the anterior horns of the cord.

2. On the other hand there is a group of symptoms, more or less analogous to the preceding from a clinical point of view, and which may even cause confusion in diagnosis, to explain which no appreciable lesion of the spinal cord can be found.

3. It can be absolutely affirmed in certain of these latter cases that the symptoms are connected with the peripheral neuritis found to be present.

4. There is room to suppose that the cerebral centres, whose participation in the process is proven by the clinical symptoms, play a pathogenic *rôle* in these cases. (Amyotrophic polyneuritis accompanied by psycho-motor affections.)

5. It does not seem possible to determine with positiveness the relation which exists between these amytrophic paralyses due respectively to poliomyelitis and polyneuritis. At the same time the hypothesis which seems most plausible is that of a lesion of the neuro-muscular arc (cerebral motor cells; ganglionic cells of the cord; motor nerves; muscles) by a pathogenic agent which attacks with greater or less intensity the different parts of this apparatus.

DIPHTHERIA.

H. WOLF (*Fortsch. d. Med.*, 1890, 8, 954) has for two years used a combination of menthol with sugar in the proportion of 1 or 2 to 20 in the treatment of diphtheria. This powder he rubs upon the parts affected by the disease. The deposit often sticks to the brush and is removed by it. The brush is then again carried into the throat and the menthol-sugar thoroughly rubbed into the part. This procedure is carried out two or three times daily. Even by the second or third day the dirty-gray appearance disappears, and a clean excavated ulcer remains which quickly heals under the continuance of the treatment. To control the fever he employs antipyretics.

ON A CASE OF INFECTIOUS ADENIE DUE TO THE STAPHYLOCOCCUS PYOGENES AUREUS.

ROUX and LANNOIS (*Rev. de Méd.*, 1890, 1011) report a case of adenie in a child which has confirmed them in the belief that certain cases of the disease are of an infectious nature. The child, a girl, eight years of age, had commenced two months before to exhibit large glandular swellings in the neck. When first coming under the observation of the writers, the glands in several parts of the body were found swollen, including those of the neck, axillæ, and groins. There was embarrassment of respiration and evidence of enlargement of the glands of the anterior mediastinum. The tonsils were enormously swollen. The liver was very large, and the spleen quite so. There was no leukæmic condition of the blood. The case ran a course fatal within two weeks, exhibiting during the illness considerable fever, attacks of abdominal pain, increase in the size of the glands, with purpura and multiple hæmorrhages. The blood contained rather numerous very large leucocytes.

At the autopsy there was found hypertropy of the glands and of the spleen, multiple visceral hæmorrhages, large white kidneys, enlargement of the liver, and multiple nodules in the lung, shown by the microscope to be miliary abscesses. Numerous bacteriological experiments are detailed, made with the blood taken during life, with fragments of lymphatic glands, and with the small pulmonary nodules. These proved the presence of the staphylococcus pyogenes aureus in the cultures, and showed that inoculations with these cultures produced, among other lesions, enlargement of the lymphatic glands.

The authors terminate their contribution with the following conclusions:

1. The different glandular affections comprised under the name of pseudoleukæmia or adenie ought to be separated into two groups, the first of which comprises the lympho-sarcomata, and the second the infectious adenies.
2. The infectious adenies themselves ought very probably to be divided into several varieties; and it is probable that these varieties are produced by different pathogenic agents.
3. The case of the child reported is an instance of infectious adenie.
4. Cultures and experiments show that the causal agent in this case was the staphylococcus pyogenes aureus.
5. It is owing to morphological and biological peculiarities presented by the staphylococcus in this case that the new characteristics, very probably, are to be attributed; resulting in microbic production of simple glandular hypertrophy instead of the formation of pus.

Hydatid Cyst of the Liver.

Shattuck (*Bost. Med. and Surg. Journ.*, 1891, cxxiv. 3) reports an instance of suppurating hydatid cyst of the liver with multiple hepatic abscesses, interesting on account of the difficulty attending the diagnosis and on account of the rarity of the disease in this country. The patient, a woman, twenty-three years of age, exhibited the symptoms of an hepatic abscess which was supposed to be due to gall-stone. There appeared to be moderate enlargement of the liver and spleen, with irregular fever, no jaundice. The sudden death of the patient prevented the thorough study of the case. The autopsy showed the cause to be the presence of an hydatid cyst, as stated. The author knows of only thirteen cases of hydatid cyst reported in this country from 1880 to 1890.

The Etiology of Tuberculosis.

H. P. Loomis (*N. Y. Med. Rec.*, xxxviii. 689) publishes a carefully prepared article based upon the evidence of thirty autopsies and upon experiments upon animals, and proving that tuberculosis may exist in the bronchial glands in adults as well as in children who are not suspected of having any tubercular affection, and in whom the lungs *post-mortem* are found unaffected. During a period of eighteen months over which the experiments extended, the substance from the bronchial glands of forty-eight persons was injected into rabbits. The majority of these forty-eight persons died suddenly, and none of them after any prolonged illness. A careful examination of all the organs in these persons failed to reveal the presence of any old or recent tubercular process. In eighteen of the cases the inoculated rabbits died too early to allow of conclusions being drawn. Of the remaining thirty cases it was found that the bronchial glands of eight contained tubercle bacilli as shown by the development of tuberculosis in the rabbits inoculated with the substance of the bronchial glands. In five of these eight cases death occurred suddenly from accident while the patient was in the midst of apparently perfect health. The author makes the point that this tuberculosis of the bronchial glands in the apparently healthy cannot but be a constant menace to the individual, and may explain the development of tuberculosis in those without hereditary taint, in which the disease seems to be excited by an acute simple bronchial catarrh, or some other non-tubercular pulmonary disease.

The article contains the case histories of the thirty cases, and the details of the inoculation experiments carried out in each instance.

REPORT ON THE KOCH TREATMENT OF TUBERCULOSIS.

OSLER (*Johns Hopk. Hosp. Bull.*, 7, 1891) describes in detail the results of the series of inoculations with the Koch fluid upon eleven cases of pulmonary tuberculosis. As far as possible cases were chosen which had been under observation for some time, and which presented well-defined but limited lesions, without extensive formation of cavity, or signs of rapid progress of the disease. The cases are reported in detail, and the paper is unaccompanied by any general conclusions. A review of the cases seems to indicate that the first case exhibited considerable reaction at times, finally with the development of albuminuria with casts, and with high fever, as a result of which the injections were discontinued. The amount of sputum was practically unaffected. The bacilli were increased in number and somewhat altered in shape. There was no alteration of the physical signs. In the second case the reaction was slight or absent. Possibly the râles were larger and louder after a month's treatment; in other respects the physical signs were unchanged. In the third case the most noteworthy feature was the great increase in the number of bacilli in the sputum. The patient lost some in weight; there was not much reaction after the inoculations, nor much fever at any time; elastic tissue appeared in the sputum near the date at which the observations are reported. The râles were not so large and loud; otherwise there was no change in the physical signs. In the fourth case, under treatment for two weeks, no special change had yet occurred in the general or local condition. The amount of the sputum was diminished. The fifth case exhibited a decided diminution in the amount expectorated; but no change in the physical signs after three weeks of treatment. Reaction was absent or very slight. The sixth case exhibited nothing to note. The reaction was sometimes well marked. The condition of the physical signs after two weeks' treatment is not stated. The seventh case had no bacilli at the outset, and seemed to be one of bronchiectasis. No reaction, except a slight rise of temperature, was developed by the inoculations. Bacilli were soon, however, constantly found in the sputum in small numbers. In the eighth case there was nothing to note. The ninth case had been under observation too short a time to allow of any conclusions. The reaction was slight or absent, except on one occasion, when it was well marked. In the tenth case, under treatment for nearly two weeks, there had been no essential change and no reaction. The eleventh case had had but a few inoculations; there had been no general reaction.

Two cases of pleurisy, suspected of being tubercular, also received the treatment. The first exhibited well-marked reaction from two inoculations, but six other injections were not followed by fever. In the second case the sputum increased, and then again diminished in quantity. The physical signs were unchanged. The reaction was sometimes fairly well exhibited.

Bacteriological-chemical Investigations on Tubercle Bacilli.

A. Hammerschlag (*Centralbl. f. klin. Med.*, 1891, 9) contributes a study on certain points regarding the chemical and metabolic characteristics of the bacilli of tuberculosis. The conclusions which he draws are as follows:

1. Tubercle bacilli contain fat, lecithin, albumin, cellulose, and a poisonous substance which produces convulsions when injected into rabbits and guinea-pigs.
2. The characteristic tinctorial nature of the tubercle bacilli depends upon a peculiar arrangement of the albuminous substance and the cellulose in the body of the microbe.
3. Carbo-hydrates and glycerin are substances indubitably necessary to the nourishment of the bacilli.
4. In cultures the bacilli produce an albuminous substance which produces rise in temperature in rabbits inoculated with it.
5. The bacilli could be with certainty robbed of their virulence by cultivating them during eight months in glycerin-bouillon at a temperature of 38–39° C. These weakened cultures did not, however, seem to have any power of giving immunity to the disease.

The Relation Between Pulse-curves and Valvular Lesions.

As a result of sphygmographic studies in cases of well-compensated mitral disease, v. Noorden (*Centralbl. f. d. med. Wissensch.*, 1891, 26) discovered that in mitral stenosis the pulse had a higher tension than in healthy men; while in mitral regurgitation the tension is less than normal. Under the same conditions, *i. e.*, in the presence of good compensation, a pulse-curve with marked elastic vibrations and slight dicrotism indicates a predominance of stenosis of the mitral orifice; while slight vibratory variations and marked dicrotism is diagnostic of a predominance of mitral insufficiency. In explanation of these facts the author assumes that not only the heart muscle, but the arterial system as well, has to do with the establishment of compensation. In mitral stenosis, namely, the work of compensation is thrown on the right heart. If, now, the systemic arteries contract, with a consequent increase of tension, a less degree of fulness of the left ventricle will suffice, and the burden of the right ventricle is thereby lessened, since it no longer needs to pump the normal amount of blood into the left side of the heart. The increase of the work for the left ventricle, due to the increased tension, is easily overcome by it. As additional signs of the increased tension in pure mitral stenosis there is not infrequently an accentuation of the aortic second sound, and a moderate increase in the thickness of the wall of the left ventricle.

In mitral insufficiency the pulse has a tendency to become large and soft, and usually accelerated. Since in this affection two paths are open for the blood during systole, the peripheral vessels must necessarily dilate and thereby diminish the resistance as far as possible, in order that the greater part of the blood may enter the aorta, consequently there is observed the suddenly rising pulse-wave and the marked dicrotism, as in cases of fever, together with a more rapid succession of heart-beats, in order to prevent a too long continuance of the low tension.

Two Unusual Cases of Pneumonia.

Kelynack (*Med. Chron.*, Nov. 1890) reports two cases of pneumonia occurring in a man and his wife, both of which present several points of interest.

As one of the patients—the woman—was taken sick but a short time after the other, the possibly contagious character of the disease is to be considered or the origin of both cases from some common miasmatic cause. The possibility of complicated enteric fever was considered, but such a conclusion was apparently unwarrantable. The unusual nervous symptoms are worthy of note. In the woman a peculiar tetanoid condition developed, which lasted several days. In the man there were choreiform movements with severe myalgia, distinct arthritis of the ankle, and intense muscular hyperæsthesia of the lower extremities. From a therapeutic point of view the cases indicate the value of continuous ice-cold applications as the only reliable antithermic agents.

The Pulse and the Arterial Tension in Aortic Stenosis.

Hagen (*Med.-chirurg. Rundsch.*, 1890, 605) refers to the views of Oppolzer, Rosenstein and Eichhorst, all of whom agree that during the systole an amount of blood less than normal passes through the narrowed aortic orifice, and that as a result of this the pulse becomes, *rarus*, *parvus*, *tardus*, and *durus*. They differ, however, in the method of explaining these phenomena. Basing his observations upon two well-marked cases the author endeavors to determine the method of the production of the pulse-characteristics. In both of the cases the radials and temporals were very prominent without thickening of the vessel-walls, without visible pulsation, compressible only with difficulty, not collapsing after the pulse-wave had passed, and having only slight elevation during the wave. He believes that the overfilling of the arteries in aortic stenosis is due to a loss of elasticity in the vessel-walls, which, as a result, can only slowly propel the blood onward, and consequently dilate more and more. The hardness of the pulse he attributes to the strong cardiac contraction, the diminished elasticity, and the overfilling of the vessels. He thinks that these pulse-characteristics occur only in pure aortic stenosis, and are pathognomonic of this affection.

EHRLICH'S TEST IN TYPHOID FEVER.

C. E. SIMON (*Johns Hopk. Hosp. Bull.*, 1890, 93) refers to the nature of the diazo compounds, and their tendency to enter into combination with aromatic bodies, and cites the first experiments of Ehrlich while endeavoring to discover some of these aromatic bodies in the urine. Owing to the controversy which arose regarding the diazo reaction, especially as to its diagnostic import in typhoid fever, the test has come to be regarded by many as a medical curiosity of no clinical value whatever. The author, however, is convinced by his experience that the original work done by Ehrlich is not appreciated, since his own results fully coincide with those which Ehrlich obtained. After explaining the chemical nature of the reaction as far as it is understood, and the methods which Ehrlich advocated, he details the modification which he has found most convenient as well as most delicate. Two solutions are made, one of 50 cc. of hydrochloric acid in 9950 cc. of water, and this saturated with sulphanilic acid; the other of a one-half per cent. solution of sodium nitrite. To make the test, 40 cc. of the first solution is thoroughly agitated with 1 cc. of the second. A few cc. of this is next thoroughly shaken in a test-tube with an equal quantity of urine. One cc. of ammonia is now allowed to run down the side of the test-tube, forming a colorless zone above the mixture, and at the juncture of the two a more or less deeply colored ring will be seen, the slightest carmine tint—the characteristic of the diazo reaction—being made out by contrast with the colorless layer above and the yellow urine below. Various plays of color may appear in different urines, but in that of typhoid fever there is produced a red coloration, which may vary from an eosin to a deep garnet. Simon has examined the urine of almost every disease which has occurred in the wards of Johns Hopkins Hospital, but has observed the reaction only in cases of typhoid fever and phthisis pulmonalis. He has had no opportunity of searching for it in cases of contagious fevers, in which Ehrlich has occasionally found it present.

The report now made is based upon observations in thirty-six cases of typhoid fever, and the details of the examinations of these are given. The results which he obtained lead him to conclude that, with the methods of examination given by Ehrlich, the reaction may be obtained without difficulty in typhoid fever from the fifth to the thirteenth day of the disease, and that with his own modification it may still be seen as late as the twenty-second day. Its absence from the fifth to the ninth day indicates a very mild case, excepting in children, although this rule is probably not an absolute one. As it occurs previously to the appearance of the rash, it is a very useful aid in the diagnosis in typhoid fever.

AMŒBA COLI IN THE SPUTUM IN A CASE OF HEPATIC ABSCESS.

SIMON (*Johns Hopk. Hosp. Bull.*, 1890, 97) reports a case of abscess of the liver in which perforation had taken place into the lung, and the giant amœbæ were detected in the expectoration. The patient, aged twenty-nine, complained of cough only. He had been a sailor formerly, and had been in the West Indies in 1883. In May he had had constipation and pains in the side; no diarrhœa, except after laxatives. In June he came under treatment elsewhere, and soon after began to cough up blood-stained mucus. At times there was a little blood in the stools, but no diarrhœa.

The cough and expectoration continued, he had two or three stools a day containing mucus and blood. He had no chills, but at times fever and sweats. On the day of admission to the hospital, October 5, 1890, the expectoration was noticed to be of a peculiar rusty, reddish-brown color, purulent, and with an odor resembling that of anchovy sauce. Actively-moving amœbæ were found in it, at once calling attention to the bowels and liver. After admission there was no diarrhœa, but one or two well-formed stools a day containing traces of blood and a little mucus, and amœbæ in great numbers. The liver was not enlarged anteriorly, but considerably enlarged behind. There was dulness and feeble somewhat tubular breathing at the base of the right lung, but no definite signs of a cavity. There were elastic tissue and alveolar epithelium in the sputum, but no tubercle bacilli. The temperature was only slightly elevated. The diagnosis in this case rested solely on the examination of the sputum, as attention would never have been called to the actual condition by the character of the stools.

SURGERY.

UNDER THE CHARGE OF

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THE PRESENT POSITION OF ANTISEPTIC SURGERY.

In an address (*Annals of Surgery*, January, 1891; *British Medical Journal*, Jan. 10, 1891) delivered in the post-graduate course of the University of Toronto, DR. J. WILLIAM WHITE replies to Mr. Tait's recent criticism of Sir Joseph Lister's Berlin address. After reviewing Tait's position, he says:

The antiseptic treatment of wounds might, under Mr. Tait's ruling, be described as a treatment directed against the causes of putrefaction in wounds; but a more accurate definition expands it, as Mr. Cheyne has suggested, so as to include treatment directed against the cause, not merely of the putrefactive fermentation, but of all fermentations.

The sterility of the blood and tissues is denied by Mr. Tait, who says: "The germs exist already in the blood and elsewhere, and are ever present, according to the best authorities." The elaborate and carefully-conducted experiments of Hauser, Watson Cheyne, and others completely contradict this statement, which is really the foundation of Mr. Tait's argument. The germ theory of fermentation is undisputed. Fermentation in wounds can, therefore, be prevented by the exclusion of germs; it has been shown microscopically that these can be kept out (asepsis) or can be destroyed (antisepsis); practically, therefore, it only remains to show the effect upon patients with operative or other wounds of excluding or destroying germs to show the value or lack of value of antisepsis and the antiseptic theory. By looking back a few years to the very beginning of the employment of antiseptics, we can obtain the most striking and convincing evidence of the effect of treatment directed almost exclusively, though then very imperfectly, against the introduction of bacteria.

The record of the work of Professor Lister may well begin our series of examples. In Glasgow, in 1864, 1865, and 1866, Mr. Lister's mortality in a series of operations of all sorts was 45.7 per cent., largely from septic diseases. About this time he began to employ gradually some antiseptic methods in his treatment of wounds and during operations. In 1867, 1868, and 1869, his mortality fell to 15 per cent. At Edinburgh, having greatly improved the details of his system, we find that from 1871 to 1887 he treated 553 grave surgical cases, with a mortality from septic disease of only 0.36 per cent., a diminution in the death-rate which, when we remember that these different results were obtained by the same man operating upon the same class of patients and for the same injuries or diseases, is so striking as to be in itself conclusive. The statistics of Volkmann and others are then given, showing with equal force the astonishing change wrought in surgical results by the introduction of antisepsis. Mr. Tait endeavors to break the chain of reasoning by saying: 1, that the germs are everywhere and cannot be got rid of—a misstatement—and 2, that the presence or absence of sepsis depends on the presence of "pabulum"—that is, dead organic matter, blood-clot, serum, etc. It has been one of the axioms of antiseptic surgery from the beginning that scrupulous attention should be paid to hæmostasis and to drainage. No one has taught this more earnestly than Lister and his followers, and Tait's adoption of it as his "view" is evidence of his ignorance of the work of others.

It is easy to say, as Mr. Tait does, that if you have nothing to decompose there will be no decomposition, for that is what it amounts to. "Get out all decomposable matter," he says, "and you can let the germs in freely," but in practical surgery this is by no means always possible. Mr. Tait deals habitually with a membrane, the peritoneum, which has a remarkable power of self-protection. Microbes gaining access to the abdominal cavity are exposed to destruction either by the serum which it copiously exudes, or by a possible phagocytic action of its enormous numbers of endothelial cells, or by both.

Mr. Tait's remarks against dosage are further evidence of his want of acquaintance with Listerian work and teachings. He says: "With the Listerians one germ is as good as a thousand." It is safe to class Mr. Watson Cheyne, who has just been quoted, as a "Listerian." In Mr. Cheyne's lectures on "Suppuration and Septic Diseases," he not only asserted, but proved experimentally, that the number of bacteria introduced modified greatly the intensity of the symptoms and even the character of the disease.

Similar observations have been made by Passet, Pawlowsky, and others, and are as well known as any in connection with antiseptic surgery.

It is evident that what is original in Mr. Tait's "hypothesis" is not true, and that what is true in it is not original.

Dr. White then replies to Tait's attack on the double-cyanide dressing (which he characterizes as "deadly and dangerous"), giving a tabulated statement of 195 cases healed with this dressing, with the course of the case and its results.

Of the five deaths in this list, two were due to preëxistent and chronic disease; the other three were abdominal cases, operated on with the patients almost *in extremis*, with swollen bellies, intestinal paresis, and in one case with suppurative peritonitis. In the whole list there were not six freely suppurative cases, and there were no cases of septic trouble and no deaths from any form of blood-poisoning.

He then discusses the relative merits of asepsis and antisepsis, and concludes as follows:

"It cannot be disputed that in the light of modern science the operator has a twofold duty, namely, to prevent the entrance of living pathogenic microbes into the wound, and at the same time to preserve the vitality of the tissues themselves. We have abundant reason to believe in a general antagonism between the body-cells and the microörganisms of disease, and it follows that the theoretical propriety of non-interference with these tissues cannot be doubted, and Lister plainly admitted and accepted this new view when he said that the floating particles of the air having been shown to be less harmful than was supposed, we may possibly dispense with antiseptic washings and irrigation, 'provided, always, that we can trust ourselves and our assistants to avoid the introduction into the wound of septic defilement from other than atmospheric sources.'

"When this method is adopted it is evident that all strong antiseptic solutions which might compromise the vitality of the tissues must be discarded; instruments, silk, ligatures, sponges, etc., must be sterilized by heat, hands must be washed clean in sterilized water (after previous chemical disinfection), and the same is true of the skin over the field of operation. If antiseptic solutions are used at all they must be very feeble—1 to 60 carbolic for instruments (after previous sterilization by heat), 1 to 10,000 sublimate for sponges, etc.

"In the meantime, however, while waiting for further improvement in this direction, I have felt and still feel that it is safer in a large general clinic to depend upon full antisepsis rather than upon asepsis."

RESECTION OF THE SACRUM IN INTRA-PELVIC OPERATIONS.

A. Broca (*Gazette Heb. de Méd. et de Chir.*, No. 40, t. xxvii. p. 467) presents an interesting article upon preliminary resection of the sacrum in operations upon the pelvic organs. These operations are of two kinds: in one the resection is final, the bone being removed; in the other, the resection is temporary, and the bone is restored after the operation. In the first operation, that of Kraske, a longitudinal incision is made in the median line from the middle of the sacrum to the anus. The tissues are divided to the bone.

The gluteal muscle and the sacro-sciatic ligaments are divided; and then with the chisel and mallet the lower left half of the sacrum is removed as far up as the third sacral foramen. The canal is not opened if the division of the bone is made somewhat to the left of the median line. This, however, is not a matter of much importance.

The temporary resection, with an osteo-cutaneous flap, was proposed by Heinecke for cancer of the rectum, and has been performed by Hégar for a gynecological operation.

A Y-shaped incision is made over the sacrum commencing an inch and a quarter below and within the posterior inferior spine of the ilium and ending at the tip of the coccyx. The upper flap is left adherent to the posterior surface of the sacrum. The muscles and ligaments are separated from the bone, and the rectum is removed from the anterior surface. Then the sacrum is divided with a chain-saw along an oblique line the right extremity of which is between the third and fourth sacral foramina, the left extremity at the sacral cornu. When the bone has been divided the flap with the skin is raised and replaced at the end of the operation.

M.M. Lévy and Delbet have modified the form of the operation by making the bone-flap from the lower part of the sacrum cut transversely across. This has the advantage of preserving the insertions and the strength of the pelvic floor.

By resection of the sacrum free access is obtained to the pelvic contents. The operation is indicated in cancer of the rectum, for hysterectomy, and for some cases of pelvic abscess; especially those which are separated from the general peritoneal cavity, and are not accessible for extirpation.

Hydatid Cyst of the Spleen.

Braine (*Annales de la Policlinique de Paris*, No. 2, p. 49, 1890) reports an interesting case of hydatid cyst of the spleen. The patient was a man, thirty-four years old, who lived in Normandy, and who had always been surrounded with dogs. In 1884 a tumor appeared in his left side which troubled him only on account of its size. In July, 1887, this tumor was tapped, and over three quarts of fluid were withdrawn. In the following October the cyst had refilled, and had reached its original dimensions. Laparotomy was performed one month later. Over two quarts of sero-purulent fluid were withdrawn by a trocar. The cyst was found to be attached to the spleen, and as it was impossible to remove it the puncture in the cyst was enlarged and the walls stitched to the abdominal wound. The patient recovered perfectly, and six months after the operation the abdominal wound was firmly closed throughout.

The Management of Fractured Limbs.

As the result of personal experience, von Donhoff (*New York Medical Record*, vol. lii., No. 20) states that the best results are obtained by first securing absolute reduction, aided, in case of fracture of the shoulder, elbow, wrist, hip, knee, or ankle-joint, by the exhibition of an anæsthetic. Next the limb should be scrupulously cleansed and the replaced fragments should be fixed in position by means of a plaster-of-Paris roller adjusted over cotton batting.

The first roller is permitted to harden somewhat before the succeeding ones are applied; the limb is then swathed, as usual, in a plaster bandage.

In fractures about the elbow the joint is fixed at an angle of 110°, because in case of ankylosis this gives the most useful limb.

The anæsthesia may be prolonged sufficiently for the plaster to harden. In two or three days the latter is carefully divided into two equal halves longitudinally, and the upper half lifted off without disturbing the limb. If the bones are in good position this upper half is again reapplied. Three days later the patient is again anæsthetized and the dressing entirely removed. If the fracture is about joints passive motion should be practised. The limb is then lightly swathed in batting, and the whole is held in position by two leather splints previously cut in shape by measurement. On the following day the upper half of the splint is lifted off and slight passive motion is practised. On the eighth or tenth day the casing is removed, its halves are bent back at the posterior border and the anterior edges are provided with shoe-lace hooks. After five days the bandage is removed and passive motion practised, after which the splint is entirely discarded during the daytime and worn only at night, the patient being instructed to practise gentle motions with the injured limb. At the end of the fourth week the cure is completed.

The results in 165 fractures treated by this method were entirely satisfactory. The author strongly urges that fixation apparatus should be discarded except at night by the fourteenth or fifteenth day.

Cysts of the Pancreas.

A report of two cases of cyst of the pancreas, which were operated upon by KAREWSKI, is given in the *Medical Press and Circular*, New Series, vol. iv., No. 2689, p. 492.

In both cases the disease followed a fall upon the side. In the first case the tumor was noticed for the first time four weeks after the accident. The man suffered with colic-like pains, dyspepsia, vomiting, and marked emaciation. Exploratory puncture revealed a large quantity of cholesterin crystals, which have been pointed out by Küster as characteristic of pancreatic cysts. Abdominal section was performed, and the cyst was tapped and sutured to the abdominal walls. Recovery was easy. The sinus was closed six weeks after operation.

The second case presented similar symptoms to the first, and recovered easily after operation.

In both these cases cyst of the pancreas was diagnosed before operation.

Contusions of the Abdomen.

M. MOTY (*Revue de Chirurgie*, No. 11, 1890, p. 878) presents a valuable paper on contusions of the abdomen, with special reference to injuries from horse-kicks—accidents of frequent occurrence in the army.

He divides the cases into three classes: the light, medium, and grave. The first class includes contusions in which the intestines and other important organs have escaped injury; simple contusion of the mucous membrane of the intestine without lesion of the other coats; cases in which a small perforation exists without escape of intestinal contents, and followed by speedy closure from adhesion.

This first class is diagnosed by the progressive disappearance of the symptoms of shock, and the absence of signs of perforation and extravasation.

The second class includes those cases which present some complication—as acute general peritonitis, rupture of a large vessel, or of important viscera: that is to say, all those cases which require a treatment of two or three weeks.

The third class includes those in which rupture or extensive laceration of the intestine has taken place.

Even in the mild cases the prognosis should always be reserved for one or two weeks on account of the possibility of peritonitis appearing later, either from the yielding of the bruised intestinal wall, or from infection through the muscular and serous coats, after destruction of the mucous coat.

An extensive contusion of the intestine is often more dangerous than a small perforation. The fact is well illustrated by a case of Jobert's. A man received a contusion of the abdomen by being run over by a carriage, and recovered perfectly in ten days. He died a month later of pneumonia, and the autopsy revealed a small perforation of the jejunum closed by adhesion to the omentum. Cicatricial contraction and consequent stricture of the intestine sometimes follow severe contusions of the abdomen.

The author considers that one of the most characteristic signs of perforation of the upper part of the gastro-intestinal tract is acute pain following a few seconds after the injection of fluids.

He arrives at the following conclusions:

1. Horse-kicks of the abdomen in many cases produce grave lesions of the intestines.

2. These lesions are perforations produced in three ways: by rupture, by crushing, and by laceration.

3. The diagnosis of perforation can often be established by the acute pains resulting after the injection of fluid.

4. Large perforations and ruptures demand laparotomy and intestinal suture.

5. This operation may be successfully performed notwithstanding the presence of peritonitis.

6. Exploratory laparotomy—for diagnosis—is not permissible. The expectant plan of treatment is always indicated in case of doubt.

7. The prognosis of contusion of the abdomen should be reserved for a month, in view of the complications which may result.

STAB-WOUND OF THE THORAX AND ABDOMEN.

BROKAW (*St. Louis Courier of Medicine*, vol. iii., No. 6, p. 257) reports a remarkable case of very extensive stab-wound of the thorax and abdomen. The thoracic wound extended from the third rib to within one inch of the navel. The lung was wounded, and the cartilages of the fourth, fifth, sixth, seventh, eighth, and ninth ribs were divided.

The abdominal wound extended from the right of the navel to within two inches of Poupart's ligament on the left side. The abdominal wound was six and one-half inches in length. There was almost complete evisceration. There was an extensive wound of the mesentery, but no wounds of the intestines. He was operated upon one and one-half hours after the injury.

Four large branches of the mesenteric artery were tied. The abdomen was freely washed out with hot water and drained with the glass tube. The costal cartilages were sutured with silk, and the interchondral spaces were drained with iodoform gauze.

The recovery was remarkably easy, the temperature never rising above $100\frac{2}{5}$° F.

The lung was at no time more than partly collapsed—a fact explainable by the presence of old pleuritic adhesions.

OTOLOGY.

UNDER THE CHARGE OF

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Otorrhagia in Cirrhosis of the Liver.

Dr. Robert Leudet, of Rouen, France, contributes an article with the above title, illustrated by a case (*Annales des Maladies de l'Oreille*, etc., October, 1890). Hæmorrhages are not uncommon in diseases of the liver. In the entire list, however, Leudet has not been able to find any mention of hæmorrhage from the ears, as occurring in the course of hypertrophic cirrhosis. The author has observed in one case only, viz., cirrhosis of the liver, a series of hæmorrhages from the ear. The subject was forty years old, a laborer in a storehouse of wines and liquors, and had been for several years a hard drinker, especially of rum. Hæmorrhages occurred frequently from the left ear, for two weeks, during his stay in the hospital. The patient then left the hospital, and was no longer observed.

Bacteriology of the Contents of the Eustachian Tube in Chronic Catarrhal Inflammations of the Middle Ear.

Drs. Maggiora and Gradenigo, of Turin, have made a long series of observations on the above-named subject. Their conclusions are that "at least in the sclerotic or dry period of otitis, the diseased process does not depend upon an infection demonstrable by any of our methods of research, but we cannot deny that we are inclined to the assumption, on the ground of clinical experiences, that in the hypertrophic and secretory stage of the naso-pharyngeal inflammation that the process depends upon some specific microörganism." (*Centralblatt für Bakteriologie u. Parasitenkunde*, October 30, 1890.)

USE OF PYOKTANIN IN EAR DISEASE.

DR. ROBERT BARCLAY, of St. Louis, Mo., reports the result of the use of pyoktanin (methyl-violet) in chronic purulent otitis media in eight cases (*St. Louis Courier of Medicine*, November, 1890). The strength of the watery solution was 1 to 1000. The results have been exceptionally good and prompt. The application has been made by instillation usually. [The yellow and the blue pyoktanin appear entirely innocuous, even in much stronger solutions, as they have been employed by us in strengths of ten and twenty grains to the fluidounce for mopping, not for instillation.—R.]

PYÆMIA AND THROMBOSIS OF INTERNAL JUGULAR VEIN FROM OTITIS MEDIA; TREPHINING MASTOID AND OPENING LATERAL SINUS.

DR. W. W. KEEN has recorded an interesting case with an operation, unique in this country (*Philadelphia Times and Register*, December 20, 1890). The patient, a man, thirty-one years old, had had a chronic otorrhœa for eight years. Five months previous to consulting Dr. Berlet, who finally called Dr. Keen in consultation, the patient had consulted an alleged specialist, who had put something into his ear, which caused intense and prolonged suffering. From that time the patient gradually developed pyæmia. On November 16, 1890, the patient had a fœtid discharge from the right ear, which showed a perforation in the membrana tympani. The mastoid was but slightly swollen; it was moderately painful upon pressure, with a little pain just above and behind it, but no pain over the course of the lateral sinus, between this point and the inion. Over the mastoid process the neck was extremely tender, though but little swollen. The jugular vein could not be felt. The patient had difficulty in swallowing, and was somewhat hoarse. He was a little jaundiced, and the liver was rather tender. There was some dulness on the whole of the right side from slight pleuritic effusion. No headache. Beginning choked discs.

The mastoid was then trephined, and a considerable amount of cheesy fœtid pus was evacuated. The bone was then chiselled away backward and upward so as to expose the lateral sinus. The mastoid vein was cut early in the chiselling, but the profuse hæmorrhage was checked by plugging with iodoform gauze. In this way three-fourths of an inch of the sinus was exposed, which looked dirty yellow, with a tinge of brown and green. It felt soft to the probe, but was detached from the bone, so that a probe could be easily passed downward and forward for over an inch, thus evacuating a little offensive pus. Dr. Keen then exposed the jugular vein in the neck. The tissues were found quite firmly bound to one another by inflammatory adhesions, but the vein was exposed after some difficulty, and found thickened, but *almost entirely collapsed*. A ligature was then thrown around it, an inch and a half above the clavicle. On cutting the vein above the ligature very little blood oozed out, but fragments of an excessively fœtid clot were evacuated from its interior. The facial vein, where it enters the jugular, was thrombosed. The part of the vein from the ligature up to the facial was then removed, and the gaping mouth of the vein above sewed to the skin by two stitches. Next the lateral sinus was opened. A violent gush of blood followed. It was instantly plugged with iodoform gauze before more than one ounce and a half of blood had been lost. The wound in the neck was now closed in the ordinary manner, and drainage maintained by horse-hair.

For the first twenty-four hours the patient did well. His temperature did not rise above 102°, and his general condition was good. He then had an attack of hæmoptysis. Some hours later he was seized suddenly with dyspnœa, "evidently due to extension of the clot in the jugular vein into the lungs, or else to an embolus which was detached and passed into the pulmonary vessels." He then died in one hour. No post-mortem could be obtained.

The operation of ligation of the internal jugular in such cases was alluded to in the chapter on Otology in this journal, December, 1890.

Fatal Ear-diseases.

Dr. F. Kretschmann, of Magdeburg, has delivered a lecture with the above title before the Society of Physicians of the Magdeburg district (date not given). The opening words are those of the late Professor von Troeltsch: "Ear-diseases are among the most serious and most frequent maladies to which the human organism is exposed." This is due to the fact that catarrhs of the upper respiratory tract invade the mucous membrane of the middle ear. A large number, therefore, of chronic aural affections are caused solely by catarrhs, or other pathological conditions of those parts. Furthermore, a large contingent of aural diseases are induced by measles, scarlatina, typhoid fever, smallpox, whooping-cough, influenza (as of late), syphilis, and tuberculosis. Von Troeltsch estimated that in every three individuals in middle life, at least one has imperfect hearing in one or both ears.

Among the results of aural diseases is first placed loss of hearing, which interferes with the labors and pleasures of life; occurring in childhood it renders the young child mute, and in any case interferes with its education. Among other discomforts are subjective noises in the ear, which are often harder to endure than the deafness. Psychoses, in those predisposed, are often induced by tinnitus aurium, and disturbances of equilibrium are often caused by chronic ear-disease.

A very accurate and concise description is then given of the anatomy ot the external, middle, and internal ear, and the relation it sustains to neighboring and vital parts in the cranium.

Meningitis from otitis is generally found at the base, rarely on the convexity of the brain. Its course is usually very short, lasting only two days, when death closes the scene. Cerebral abscesses are frequently caused by chronic purulent otitis. They are most frequently found in the temporal lobe, and, in the cerebellum, are usually separated from the surface of the temporal bone, and the pus-nidus in the same, by a thin layer of healthy brain-substance. Half of all abscesses in the brain are due to chronic purulent processes in the middle ear. Their diagnosis is often obscured by the presence of meningitis. Extensive destruction of brain-substance can occur without fever or disturbances in mobility, sensibility, or intelligence. In most cases, however, complaint is made at intervals of headache, combined with nausea and vomiting, which is, at first, sometimes mistaken for migraine.

In abscesses of the cerebellum there is constant pain in the occiput. There may occur vertigo, unsteady gait, hectic fever, inequality in the pupils, choked discs, defective memory, and slow pulse, and sometimes aphonia. Death results either from cerebral pressure or from meningitis induced by rupture of the abscess within the cranial cavity.

Perhaps the most frequent cause of death from chronic purulent otitis media is pyæmia, brought about by phlebitis of the cerebral sinuses, usually of the lateral sinus. Systemic infection from a thrombus in such cases shows itself by chills, followed by sudden rise in temperature. The fall in temperature is just as sudden, accompanied by excessive perspiration.

In some cases erosion of large veins or arteries near the ear is the cause of death. In other instances cholesteatomatous collections form in the tympanic cavity or in the mastoid antrum; more commonly in the latter. Pressure from these masses upon surrounding bone leads to atrophy and erosion of the same. In this way the cranial cavity, the transverse sinus, the external auditory canal, or the labyrinth may be broken into, and meningitis, cerebral abscess, or pyæmia be set up.

Carcinoma and sarcoma may appear in the chronically diseased ear, the first being developed from an old otorrhœa, originating from the epithelium of the auditory canal or the drum-cavity. Its duration is about one year and a half. It usually attacks those between forty and sixty years of age.

Sarcoma develops generally from the dura mater or from the periosteum of the mastoid process. Its course is more rapid than that of carcinoma, being only from three to six months. It occurs most frequently in children.

Thus it is shown that a purulent process in the ear is no trifling matter.

OPHTHALMOLOGY.

UNDER THE CHARGE OF

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THE OPERATIVE TREATMENT OF PTOSIS.

DR. HEISRATH, of Königsberg (*Berliner klinische Wochenschrift*, January 19, 1891), has, by his experience with excision of portions of the conjunctiva for granular disease of that membrane, been led to adopt an allied procedure for the relief of ptosis. His operation removes a strip of the tarsal cartilage with the corresponding portion of the conjunctiva, and brings the edges of the wound together with three or four sutures, which are allowed to remain until the fourth day, the patient being confined to bed or to his room. The length of the strip parallel to the palpebral fissure is about that of the lid, and its width equal to the additional height to which it is desired to have the upper lid raised. The operation can be done under cocaine, as it is not prolonged, and even without complete anæsthesia will not cause great discomfort.

THE DIVISION OF ANTERIOR SYNECHIÆ.

W. **LANG** practises and recommends (*Royal London Ophthalmic Hospital Reports,* December, 1890) the general division of these cicatricial connections between the iris and cornea, whether left after cataract extraction, accidental wounds, or perforating ulcers, either large or small; and whether the connection be merely between the anterior surface of the iris and posterior surface of the cornea, or the iris or lens capsule be entangled in the wound. The division is accomplished with a blunt-pointed knife. In dealing with incarcerated capsule or thread-like synechiæ, the elasticity of the structure to be divided makes necessary quite free movements, and sometimes one or more repetitions of the operation. In such cases it is well to put the synechia on the stretch by the use of eserine or atropine, according as it is peripheral or central.

Large adherent leucoma should thus be treated soon after the anterior chamber is well established, and before corneal staphyloma occurs, or secondary glaucoma sets in. Were this generally attempted, many eyes would be saved from loss through these pathological conditions. Even where the leucoma seems to extend up to the very edge of the cornea, it must be remembered that the angle of the anterior chamber extends back of the sclera to a region very rarely or never involved in perforating ulcers. So that it is possible even in these cases to pass the blunt-pointed knife back of the synechia and sever it.

GLIOMA OF THE RETINA.

J. B. **LAWFORD** and E. T. **COLLINS** (*Ibid.*) present a study of the records of sixty cases, five from private practice, the others from the service of the Moorfields Hospital in the last twenty years. As to sex, males slightly predominate. The age at which the presence of the growth was first noticed, as near as this could be determined, was, at birth in five cases; during the first year in seventeen others; during the second year in thirteen; and the oldest patient was seven years. In all of the cases included, the microscopic examination of the enucleated eye conclusively established the diagnosis of glioma. In eight cases there is known to have been permanent recovery—that is, the patient was alive and well more than three years afterward, longer than the latest recurrence of the disease after removal. Six others are known to be still alive, but three years have not elapsed, and in one of them the other eye is involved. Twenty-eight of these cases are known to have terminated fatally; the longest duration of life after the operation in any of these fatal cases was fourteen months. The average interval between the discovery of the disease and the removal of the globe, was: in six cases that are known to have recovered, four months; and in sixteen cases that terminated fatally, fourteen months. Family history seemed to throw no light on the etiology of the affection. No instance was found in which it had attacked more than one member of the same family. These statistics, which agree in the main with those previously recorded, teach that glioma is not a hopeless condition as regards life, but that the chances of cure are greatly diminished by delay of removal of affected eye or eyes.

INDICATIONS FOR ENUCLEATION OR EVISCERATION OF THE EYEBALL.

DR. BRAUNSCHWEIG, from a general review of the subject (*Deutsche medicinische Wochenschrift*, January 8, 1891), comes to the following conclusions: The orbit is to be emptied of its contents for malignant new-growths that have emerged from the eyeball, or which, without starting from the eyeball, which may be sound, have so involved the other orbital contents that nothing less will secure their complete extirpation.

Enucleation is to be resorted to for intraocular tumors that have not perforated the sclera, and therefore have not involved the extraocular tissues; for intraocular disease that tends to extend centripetally through the optic nerve or its sheath, as glioma of the retina or sympathetic ophthalmitis. Enucleation is also to be used instead of evisceration, when the utmost reduction of pain and shortening of the period of healing are aimed at, without regard to the cosmetic result.

Evisceration is to be undertaken when something must be done for increase and change of form of the globe, independent of new-growths, as staphylomatous degeneration; for panophthalmitis whether or not it involves the orbital cellular tissue; for disease confined to the scleral contents, as foreign bodies in the interior of the globe, irido-cyclitis, glaucoma, or sympathetic ophthalmia; and for wounds that exclude the hope of preserving the eyeball.

QUININE BLINDNESS.

DR. G. E. DE SCHWEINITZ reports (*Ophthalmic Review*, February, 1891) on the ophthalmoscopic appearances and the pathological anatomy of the nerves and centres in quinine blindness as developed experimentally in dogs. When the drug was given hypodermically—from one to four grains to the pound of the animal's weight, blindness, generally accompanied by more general disturbances, was apparent in from three to fourteen hours. It remained practically complete in one animal until twenty-nine days, when it was killed. In another there was slight return of vision after thirty-six hours of blindness.

In all, the pupils were immovably dilated, and the ophthalmoscopic appearances were similar to those of quinine amaurosis in man. In one there was complete obliteration of the vessels, and in another blurring of the optic discs. In one case, two days after the quinine was given, blindness being complete, a constriction was noted in one of the veins as though a thrombus had formed, and the microscopic examination verified the diagnosis. The specimens examined microscopically included the eyes, nerves, chiasm, tracts, and occipital lobes. They were hardened in Müller's fluid, cut by the paraffine method, stained by borax carmine and indigo-carmine, and degenerations sought by Weigert's method. Cross-sections of the nerves showed, in some, a widening of the connective-tissue trabeculæ, and spreading apart of the individual nerve fibrils, as if the tissue were œdematous and swollen. In sections taken from the cuneus there was in all instances a remarkable dilatation, of the pericellular lymph spaces with degeneration of the protoplasm of the cell. This was probably most marked in the dog longest blind. It is pointed out that these appearances may be due to imperfections in the hardening process. Except the single case of clot in the central vein, no positive microscopic lesion was made out. But, even in dogs blind a month, there is no atrophy of the nerve fibres in the ordinary sense; neither is there any appearance of neuritis in the earlier stages.

DISEASES OF THE LARYNX AND CONTIGUOUS STRUCTURES.

UNDER THE CHARGE OF

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Ethyl Bromide in Operations in the Nose and Rhinopharynx.

In removing adenoid vegetations, Calmettes and Lubet-Barron very highly recommend (*Gaz. Hebd.*, August 23, 1890) anæsthesia under ethyl bromide and excision with the trianguloid ring-knife of Moritz Schmidt.

In operating upon posterior turbinate hypertrophy Dr. A. E. Prince, of Jacksonville, likewise extols anæsthesia by ethyl bromide (*N. Y. Med. Journ.*, August 30, 1890). He uses a pair of slender gouge curved turbinate forceps passed through the inferior meatus. The extremity of the forceps is controlled by a finger passed through the mouth, and the mass is removed by a torsion movement which partly cuts the morbid tissues and partly tears them.

Suppuration of the Maxillary Sinus.

Dr. Moreau R. Brown, of Chicago, who has had an unusually large experience in these cases—nineteen cases within eighteen months—recommends (*N. Y. Med. Journ.*, July 19, 1890) penetrating the most dependent portion of the antrum immediately above the alveolus or through its upper portion. He either divides the mucous membrane, or excises a small section with a tubular knife just below the gingivo-labial fold between the upper portions of the roots of the second bicuspid and the first molar teeth. A drill, best propelled with an electric motor, is entered at the point of incision and is directed upward, inward, and slightly backward, so as to form an angle of about 45 degrees with the plane of the alveolus. After thorough cleansing, a gold tube is so fitted for drainage that its distal end will just enter within the antrum, and the projecting extremity carries a small strip of gold which is fastened to a collar around the tooth. This affords free drainage without any necessity for plugging the tube to prevent access of foreign substances into the antrum. Dr. Brown has found that ten of his cases thus treated have invariably done better than those in which an opening had been made through the alveolus from below.

ERYSIPELAS OF THE PHARYNX AND LARYNX.

According to DR. MASSEI (*Rev. Gén. de Clinique*, etc., August 20, 1890), erysipelas of the pharynx and larynx can be diagnosed by three symptoms: 1. Swelling of the mucous membrane of the base of the tongue, the epiglottis, and the ary-epiglottic folds, producing dysphagia. 2. The mobility (diffluence?) of this swelling, which, by its rapid production and its no less rapid subsidence, renders the functional symptoms equally evanescent. 3. The temperature and fever, which are those of erysipelas.

Differential diagnosis from neuralgic angina is facilitated by the simultaneous or consecutive localization of the disease in the pharynx and larynx.

Massei also distinguishes two forms of erysipelas, *i. e.*, primitive and consecutive, the latter being a complication of migratory pneumonia, or an accidental development in adynamic subjects.

The treatment consists in ice internally and upon the integument; pulverizations of corrosive sublimate 1 : 2000; tracheotomy, when indicated by serious complications.

PHARYNGEAL SYPHILIS FATAL BY ULCERATION OF THE INTERNAL CAROTID ARTERY.

DR. V. RAULIN reports (*Annales de la Polyclinique*, July, 1890) from Moure's clinic, a case of syphilis of the pharynx in a male cook, twenty-two years of age, which progressed to denudation of the bodies of the upper vertebræ, and terminated suddenly by hæmorrhage. Four years previously, the patient had had a chancre which healed very quickly, and which had been accompanied by bilateral suppurative adenitis. Though not submitted to mercurial treatment, there had been no mucous patches, roseola, or alopecia. Minute inspection failed to reveal any other sign of syphilis than the pharyngeal lesion. The disease was believed to be an example of a tardy manifestation of hereditary syphilis; an opinion supported by the history of the death of all his brothers and sisters, seven in all, at the ages of four, five, six, and seven years.

ELECTRO-CAUSTIC AMYGDALOTOMY.

In an elaborate article, well supported with statistical references, on hæmorrhage after amygdalotomy (*N. Y. Med. Journ.*, August 30, 1890) DR. JONATHAN WRIGHT, of New York, condemns the operation in adolescents and adults, in whom severe hæmorrhage is much more likely to occur, and extols it in the cases of children, in whom the danger is practically nothing. We would simply remark in this connection that very serious hæmorrhage does occur at times in young children, and when it is severe is more difficult of arrest by topical measures than in adolescents and adults. Dr. Wright proposes section of the tonsil with an amygdalotome, the cutting blade of which is an incandescent wire heated by the electric current. Taking Mackenzie's amygdalotome for adaptation, he removes the steel blade and substitutes one made of compressed paper, a non-conductor, with its extremity excavated in the form of a crescent across which the platinum wire is stretched. By means of copper wires inlaid along the sides of the blade, the platinum wire is connected with binding screws at the other end of the instrument, where, by means of the ordinary spring, the circuit from a cautery battery is closed by the pressure of the thumb as the blade is driven against the mass included in the loop of the instrument when adjusted.

CARCINOMA OF THE ŒSOPHAGUS, WITH INVOLVEMENT OF THE TWELFTH DORSAL VERTEBRA.

DRS. JAMES FINLAYSON and JOSEPH COATS report (*Glasgow Med. Journ.*, September, 1890) a case of cancer of the œsophagus involving the left recurrent laryngeal nerve in a male subject fifty-six years of age. He had aphonia and paralysis of the left vocal band, cough and expectoration, aphagia as to solids and great dysphagia as to liquids. There was severe pain in the abdomen which could not be accounted for.

After death a small tumor, partly ulcerated, was found in the anterior wall of the œsophagus about the level of the bifurcation and firmly adherent to the parts in front, where it was continuous into a bulky mass involving the root of the lung and involving the left recurrent laryngeal nerve. The intrinsic muscles of the left half of the larynx were distinctly atrophied. There was a second tumor almost replacing the substance of the body of the twelfth dorsal vertebra and projecting beyond the inter-vertebral cartilages. The spinal canal was reduced to a diameter of three-sixteenth inch.

PERICHONDRITIC ABSCESS OF THE LARYNX WITHOUT THE USUAL SYMPTOMS.

DR. DAVID NEWMAN, of Glasgow, records (*Glasgow Med. Journ.*, September, 1890) an interesting case of laryngeal perichondritis in a previously healthy female, forty-five years of age, which terminated fatally about two months after the initial manifestations, which were rigors, soon followed by slight sore-throat, in its turn gradually increased to hoarseness, inspiratory dyspnœa, and cough. Œdema of the mucous membrane of the arytenoid cartilages and of the ventricular bands left an exceedingly narrow chink for respiration. There was great cardiac debility. Against the advice of her attendant, the patient left the hospital when somewhat relieved. Subsequently she had several severe attacks of paroxysmal dyspnœa, probably due to laryngeal spasms. The cardiac debility increased, and death ensued quietly without any signs of dyspnœa.

At the autopsy the posterior surface of the cricoid cartilage was found eroded a little to one side; and immediately below the vocal band of the opposite side was an opening leading into a small abscess cavity which reached down the trachea for about half an inch.

There had been no pain on glutition, no enlargement of cervical lymphatic glands, no swelling in front or around the larynx, no pain on external palpation of the cartilage, and no expectoration or accumulation of purulent products; consequently no symptoms indicative of the character of the disease, which, however, indicated some serious deep-seated inflammation by reason of the hoarseness, the œdema, and a somewhat stridulous cough.

DERMATOLOGY.

UNDER THE CHARGE OF

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Koch's Treatment of Lupus at the Vienna General Hospital.

Kaposi, of Vienna (*Medical Press and Circular*, February 4, 1891) showed thirty-two cases of lupus that had been treated by the injections, many of which had remarkably improved in appearance at first, as is always the case after inflammation (as after erysipelas). Attention was called to the similarity of the process with that of inflammation and exudation, the so-called necrotic action of the fluid being denied. When in Berlin, Kaposi stated to Koch that he did not believe, from what he had seen, that lupus could be cured in six weeks, and his subsequent observations have confirmed these views, for from the above thirty-two cases not one is cured, after more than six weeks' treatment. Many have ceased to react to even very high doses of the fluid. In some cases the amelioration of the symptoms having passed off, the lupus nodules have again become very distinct, and in one case nodules have appeared weeks after the treatment in places where there were none before. One case of anæsthetic (macular) leprosy reacted to an extraordinary and intense degree, being converted into a kind of tubercular leprosy; in fact, the condition of the patient was undoubtedly aggravated by the injections. Billroth has only had one really striking case, a patient with actinomycosis, who very much improved under the treatment, and for whom there were entertained hopes of a permanent recovery. Schrötter presented a case of tubercular laryngitis which had been made much worse by the treatment.

Koch's Fluid in Lupus.

Thibierge (*British Journal of Dermatology*, January, 1891) of the St. Louis Hospital, Paris, gives a full report of the results of this treatment as observed by himself in Berlin. While fully acknowledging the enormous diagnostic importance of Koch's discovery and its influence on tubercular tissue, Dr. Thibierge says plainly that as far as lupus is concerned, there was not one single case amongst all those which he could see in Berlin which had been even *apparently* cured by the injections. In every case which he had examined, some of which had been injected for two months, the little round apple-jelly or barley-sugar nodules in the corium were still present, and would prevent any experienced dermatologist from regarding the case as cured. Thus, in one case of extensive lupus of the face which had undergone eleven injections, the last three being of the strength of two centigrammes, and which was presented as a cure by the assistants in the clinic, because no further local reaction could be produced, nodules could be plainly seen when the superjacent hyperæmia was removed by stretching the skin between the fingers. Another case, a woman, who had been subjected to sixteen successive injections between October 11th and November 26th, presented no local or general reaction after the thirteenth injection, even though the doses in the last injections had been as high as 14, 20, 30, and 40 milligrammes. In spite of the treatment a number of very evident lupus nodules could be still seen lying in the supple cicatricial tissue, which had replaced the previous lesions. Much of this misplaced enthusiasm was due to dermatological inexperience, these cases having been treated in the ordinary surgical clinics. Extraordinary and perfectly unique as is the power of the injected fluid to cause the shrivelling up and destruction of lupus tissue, up to the present time it seems to have failed to completely eradicate this disease in any one single well-authenticated case.

KÖHLER, of Berlin (*Medical Press and Circular*, February 4, 1891), exhibited two cases of lupus before the Free Society of Surgeons that had been under treatment for three months. The first was a case of lupus of the nose, upper lip, both cheeks, and lower jaw. The alæ of the nose showed the ulcerating form. On injection the general and local reaction was great. Tubercle bacilli were found in the crusts. From October 20th the patient had received 730 milligrammes of the fluid, and since November 20th there had been absolutely no reaction. The healing on the alæ of the nose, where ulceration had existed, was an ideal one. Other localities did not respond so well, redness still remaining.

The second case was a disease of fourteen years' duration. First injection October 11th. The total quantity injected was 1240 milligrammes, the largest dose being 110 milligrammes. No reaction since November 3d. Healing took place with redness and scaling. This case does not seem to have resulted so satisfactorily as the first, and, as Dr. Köhler remarked, neither case could be considered as entirely cured.

OBSERVATIONS ON THE QUESTION OF DUHRING'S DISEASE.

HANS VON HEBRA (*Monatshefte für prak. Dermatologie*, Bd. ix., No. 6) calls attention to the fact that Auspitz, in his *System of Skin Diseases*, described Duhring's disease under the title of "erythema neuriticum," among the "inflammatory tropho-neuroses with irregular course," and that Hebra, Jr., himself, also described the disease in his treatise (a year before Duhring) as erythema neuriticum, herpes, and pemphigus neuriticus, chiefly with the view of distinguishing it from pemphigus. The author does not wish to detract in any way from the light thrown upon the disease by Duhring and Brocq. Concerning the nomenclature, Hebra sees no objection to the use of the old term "Hydroa," as proposed by Unna.

Dermatitis Herpetiformis.

W. Allan Jamieson (*Edinburgh Medical Journal*, January, 1891) gives an interesting article on this disease, with a short account of seven cases, two of them being in children aged two and a half and three years respectively. But the notes of these two cases are not sufficiently clear or full to portray the disease satisfactorily, which is to be regretted, as typical cases have not been reported in children. The author agrees with Duhring, Brocq, and Unna, that the disease is a substantive one, and goes even further than the authors cited in regarding the impetigo herpetiformis of Hebra and Kaposi as a pustular variety of dermatitis herpetiformis. The best results in treatment have been obtained from moderate doses of arsenic, but no detailed report of the action of the remedy is given.

Observations on Prurigo, Clinical and Pathological.

R. W. Taylor and Van Giesen (*New York Medical Journal*, January 3, 1891) go into the subject very thoroughly, and conclude that there is a chronic inflammation of the derma in this disease, most extensive just below the pars papillaris, although the latter, with its papillæ, is also affected in places. It is of the chronic cellular variety, produced by a proliferation of the connective-tissue cells just about the bloodvessels. The hair follicles, sebaceous glands, and smooth muscle fasciculi become changed secondarily, and are not the primary or essential lesions of the disease. They epitomize the disease, succinctly, as follows: Prurigo nodules and papules are due to a circumscribed effusion in the deeper derma or papillæ, which soaks into the rete and produces cysts, which may subsequently atrophy, and is accompanied by a chronic cellular inflammation in the derma with secondary alterations in the hairs, sebaceous glands, and smooth muscle bundles, and hypertrophic regions in the epidermis.

A Case of Rhinophyma—Operation.

Ohmann-Dumesnil, of St. Louis (*St. Louis Clinique*, October, 1890), reports, with photograph, a case of highly-developed rhinophyma, or hypertrophy of the nose, occurring in a man seventy years of age. The disease began as acne rosacea, caused by indulgence in spirits, and during the last five years rapidly passed into the condition known as rhinophyma. The end of the nose became lobulated and so much enlarged and hypertrophied as by its weight and pressure upon the nostrils to cause difficulty in breathing. Operative interference was demanded, and ablation of the entire mass by the knife was performed, as follows: The lobes of the tumor mass were removed, leaving a small flap of the integument of each in order to cover the denuded surface. This flap in each case was derived from the lower part and laid up, so as to bring the line of stitches at about that portion of the nose which would correspond to the sulcus of each ala. In the case of the middle lobe, of course, the line of sutures was directly across the nose. The dissection of the skin flaps was carefully done so as to have as thin an integument as was consistent with the nutrition of the parts. Healing occurred *per primam*, the dressing having been iodoform collodion." The final result, on the whole, was satisfactory. The author calls attention to the importance of allowing for the contraction of the integument as well as of the scar in such cases. The microscopic examination of the growth agreed, in the main, with that given by authors.

OBSTETRICS.

UNDER THE CHARGE OF

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The Use of Koch's Lymph in Nursing-children.

Epstein (*Prager medicinische Wochenschrift*, No. 2, 1891) has made injections of Koch's lymph in a number of infants, and summarizes his observations as follows: Five children who were either suffering from tuberculosis or seemed strongly predisposed to it, showed a peculiar painful œdema, as large as a silver dollar, at the site of the injection, which usually disappeared in six to eight days. Suppuration never occurred, but the skin showed a pale reddish infiltration which seemed to be a direct reaction to the injection. As regards the general effects, a rise of temperature began five or six hours after the injection, and persisted a longer time than is usual in the case of adults. In one case, fever persisted for four days. The general condition of the children was somewhat disturbed by the restlessness and prostration which always accompany an elevated temperature; pronounced symptoms, however, of some effect upon the nervous system were wanting. Regarding dosage for children under three years of age, one-tenth of a milligramme was given, and in some instances, one-twentieth. As a means of diagnosis, Epstein considers that the lymph has a positive and decided value among children.

Gun-shot Wound of the Pregnant Uterus, with Recovery.

Bradley (*Southern Medical Record*, No. 2, 1891) describes the case of a primigravida six months pregnant who shot herself, the ball entering four inches to the right, and on a line with the umbilicus. When first seen, she was suffering but very little from shock. She was anæsthetized with chloroform, and the wound was found to be a penetrating one. She was sitting in a low rocking-chair when she attempted suicide, the pistol being held close to the body. A probe could be passed between the muscles to Poupart's ligament. Upon laparotomy, the abdomen was found filled with blood and clots, and a ball-wound was found to the right side of the fundus of the uterus near the attachment of the Fallopian tube. This wound was closed by sutures, no wound of exit for the ball being found. About twenty-four hours after the injury was received, the patient aborted with a six-months' fœtus. The fœtus had a ball-wound just behind the acromion process of the scapula, another above the umbilicus, and the right leg was shattered below the knee. The patient recovered in four weeks from the time of the injury.

CONGENITAL NARROWING OF THE VAGINA AND ITS INFLUENCE UPON LABOR.

KLEINWÄCHTER (*Prager medicinische Wochenschrift*, No. 48, 1890), reviewing the literature of this subject and describing cases observed by him, concludes, regarding the treatment of labor in such a condition, that interference should be deferred as long as possible, finding, in thirty-eight cases, that labor proceeded normally in thirteen; in ten cases it was necessary to make multiple incisions, when labor resulted spontaneously. In four the forceps was used; in nine cases multiple incisions did not avail to secure the delivery of the patient, and the forceps was used in addition. In seven cases dilatation was practised during pregnancy, labor resulting spontaneously in only three of these. The conclusion reached was that a serious operation is very rarely demanded in these cases.

PATHOLOGICAL DENTITION.

AN able plea for incision into the gums in cases of pathological dentition appears in the *Annals of Gynæcology and Pædiatry*, January, 1891, from the pen of Dr. J. W. White. He shows conclusively the unquestioned indication for incising the gum over the tooth in many cases, and cites convincing proof of the immediate relief which follows such a procedure. The incision should vary somewhat with the shape of the tooth which it is destined to liberate; thus, over an incisor the cut should be a simple linear one, while over the molars a crossed incision is better.

LYSOL, A NEW ANTISEPTIC, AND ITS USE IN OBSTETRICS.

As an improvement upon creolin, MICHELSEN (*Centralblatt für Gynäkologie*, No. 1, 1891), describes his experience in the use of lysol, a preparation of oil of tar. This is a brownish-yellow-colored, oily fluid, smelling faintly of creasote and remaining perfectly clear when diluted with water. A peculiarity of this substance is the fact that it does not make an emulsion with water as does creolin, but a clear solution results when it is mixed with water. Bacteriological tests show it to be as efficient as carbolic acid and creolin. Michelsen has tried this substance in gynecological operations and also in obstetric practice. He finds that in solutions varying from one to five per cent., this substance gave satisfactory results. Its ready solubility, clear color, and freedom from disagreeable odor make it a very convenient antiseptic. So far, no instances of poisoning have attended its use.

The Results of Enlargement of the Lymphatics in Puerperal Septic Infection.

Souligoux (*Bulletin de la Société Anatomiquede Paris*, p. 523, 1890), draws attention to the result of enlargement of the lymphatic ganglia in puerperal sepsis. He finds that many of the pelvic pains complained of after this infection are caused by pressure of the enlarged ganglia upon nerve-trunks. The usual function of these bodies is well illustrated in sepsis by their absorption of the septic virus, and the fact that in severe cases a tendency to the formation of abscesses in the ganglia is observed.

Epilepsy Produced by Injury with the Forceps.

It is rare that epilepsy can be traced distinctly to an injury produced by forceps, but in a case reported by Lane (*Lancet*, p. 139, 1891), a boy sixteen years old was found to be suffering from pronounced epilepsy apparently caused by an injury to the skull produced by forceps. On examination, there was a groove about three and one-quarter inches long, extending from an inch behind the right coronal suture to about the same distance in front of the lambdoid. Its anterior extremity was above the auditory meatus, its lower limit at the temporal ridge. The floor of the groove seemed a quarter of an inch below the scalp; the left arm was weaker than the right, and its movements defective. The left leg was also of deficient power. A clonus could be produced by raising the left foot, and the reflexes were much exaggerated. The optic discs were normal, the pupils reacted normally, and no evidence of syphilis existed. Lane raised the depressed area of bone, which was exceedingly vascular. The bottom of the depression encroached upon the area of the skull. The *dura mater* was normal, and also the brain beneath. Rapid amelioration of the symptoms followed the operation, giving rise to the hope that ultimate recovery would ensue.

Concealed Accidental Hæmorrhage during Labor.

A fatal case of concealed hæmorrhage is reported by Coe (*American Journal of Obstetrics*, February, 1891). The patient was a primipara of nervous temperament, the fœtus being in normal position and presentation. The first stage of labor was delayed by inefficient pains and by the patient's nervousness. She complained of constant pain in the lower part of the abdomen. She had a slight hæmorrhage when dilatation was half completed. On examination, the os was found half dilated, the head engaged, the membranes intact. The pains had become true labor-pains. On palpation, the uterine tumor was larger and softer than previously; fœtal parts indistinct. The patient's pulse was accelerated; she felt weak. The fœtal heart could not be heard, and speedy delivery seemed indicated in the interest of the child. While the patient was using a commode, she had a profuse hæmorrhage. Strong pains began, the membranes were ruptured, the head descended rapidly. As the pulse grew weak, the forceps was applied, and a large, dead child delivered. The placenta was expressed, followed by large clots and a pint of fluid blood. Uterine inertia followed, with very weak pulse and death from heart-failure. While Coe expresses no positive opinion regarding the exact mode in which the hæmorrhage occurred, it seems probable to him that when the patient assumed the upright position upon the commode, the placenta was largely or wholly detached. It was noticed that the placenta was the seat of general fatty and calcareous degeneration. Unfortunately, it was not minutely examined.

GYNECOLOGY.

UNDER THE CHARGE OF

HENRY C. COE, M.D., M.R.C.S.,

OF NEW YORK.

Hæmatocele and Hæmatoma.

Veit, in a paper (*Med. Anzeiger zum Centralblatt für die ges. Medicin*, 1890), on this subject read before the last International Medical Congress contends for a more exact diagnosis between intra- and extra-peritoneal hæmorrhage. An effusion of blood within the healthy peritoneal cavity never becomes encysted; if the bleeding ceases the blood is absorbed, if it continues death results. In order that a true hæmatocele may be formed either the effused blood must be encapsulated or slow bleeding must occur into a cavity already formed by adhesions, as is usually the case in extra-uterine gestation.

The diagnosis of free hæmorrhage into the peritoneal cavity rests upon the presence of the usual signs of profound anæmia and not on physical signs, since nothing pathological can be palpated; the differential diagnosis between hæmatocele and hæmatoma, on the other hand, is not usually difficult, as a tumor is always felt. When the former condition is suspected the abdomen must be opened at once.

Landau, in discussing this paper, denied that the recognition of a considerable quantity of free blood within the peritoneal cavity was difficult; dulness of the abdomen on percussion would give a clue to this condition. While it was true that blood effused within the normal peritoneal cavity did not coagulate and consequently tended to become absorbed so long as it was in contact with living epithelium, coagulation would take place as soon as the epithelial layer was destroyed at any point; this might occur from the irritation caused by the stagnating blood itself. As soon as coagulation took place, the formation of pseudo-membranes and encapsulation would follow.

Observations on Thure Brandt's Method.

Landau (*Ibid.*) says that we are most indebted to Brandt for his improved method of pelvic examination, which leads to more accurate diagnosis by educating the muscular as well as the tactile sense. The examiner learns to palpate the patient in different postures, while he himself changes his position from side to side as may be required, not confining himself to the foot of the table. The danger in these manipulations lies in cases of inflammatory trouble, but as the patient is not etherized her pain will serve as a ready guide as to when the examiner has gone too far. By studying this method we learn the finer points in diagnosis, the most important of which is the variable consistence of pelvic enlargements. Thus, by becoming perfectly familiar with the manner in which the empty uterus contracts under bimanual pressure we learn to distinguish the difference in its behavior when it is the seat of a myoma or of metritis; in the former case it contracts irregularly, in the latter it does not contract at all. Again, the spontaneous changes which take place in diseased adnexa are recognized by such careful examination—such as the filling and emptying of distended tubes. He believes that gynecologists have too much faith in the information which can be gained by a single examination of a patient under an anæsthetic.

In discussing the paper Skutsch denied that gynecologists had learned palpation from Brandt, since the latter made no essential departure from the ordinary methods of examination. No one but an expert ought to practise pelvic massage.

Kugelmann stigmatized massage as "a sort of onanism."

Landau, in reply, explained that he meant that repeated careful examination of a patient, according to Brandt's method, not anæsthetized, was attended with less danger than a single examination under chloroform. The proof that the usual methods of examination were not always so satisfactory was shown by the frequency with which the text-books recommend the use of an anæsthetic.

The Treatment of Uterine Fibromata and of Salpingo-oöphoritis by the Constant Current.

Gautier (*Ibid.*) has treated ninety-five cases of fibroid with galvanism with the best results. He is firmly convinced that the positive pole has a caustic action upon the endometrium, which opinion he has confirmed by microscopical examinations. Eight patients with pyosalpinx were treated by galvano-puncture, a mild current of twenty to thirty milliampères being used, and in each instance the pus was absorbed, pain was relieved, and laparotomy (which had been strongly advised) was rendered unnecessary. He prefers galvano-puncture in cases of fibroma, and denounces extra-uterine galvanization as based upon an erroneous theory and without positive results.

In discussing this paper Bröse laid down the following rules for procedure: 1. The physician who essays to practise the galvanic treatment must be familiar with the principles of physics and electro-therapy, as well as with gynecology. 2. Intra-uterine galvanization is alone to be employed in cases of fibroma, endometritis, and pelvic exudation; the use of the vaginal electrode should be discarded, at least when strong currents are employed, since extensive ulceration may be produced. 3. Patience on the part of both physician and patient are required in the treatment of fibromata, since it may extend over several months. 4. The deeper the uterine cavity, the more difficult it is to check the hæmorrhages, and the operator should at the outset ask himself whether the patient's strength will hold out during the three or four months which may be required, or whether it would not be wiser to perform myomotomy at once. 5. The galvanic treatment will never entirely replace myomotomy, but it will render the operation unnecessary in many cases. It is possible that the cure might be hastened by a combination of curetting with intra-uterine galvanization. 6. The most gratifying results are obtained in the treatment of perimetric indurations, which are often quickly absorbed; intra-uterine galvanization is preferable, the anode being used if endometritis is also present, otherwise the cathode. 7. Endometritis complicated with perimetritis is best treated in this way. 8. Dysmenorrhœa is relieved by intra-uterine galvanization, but it is not yet certain that stenosis of the cervical canal can be permanently overcome in this way.

Trendelenburg's Posture for Gynecological Examinations.

Stroynowski (*Centralblatt für Gynäkologie*, January 19, 1891) thinks highly of the advantages of this posture in examinations of the pelvis, as well as in laparotomy, especially in certain cases in which the diagnosis is obscure. In a case in which the presence of free fluid in the peritoneal cavity made it impossible to mop out the pelvic organs with the patient on her back, she was placed in Trendelenberg's posture, the fluid gravitated to the upper part of the abdomen, and it was then possible to feel the uterus and adnexa without difficulty. A similar course was followed in cases of intra-ligamentous cyst and subperitoneal fibroid in the utero-vesical pouch. So that now the writer invariably adopts this method of examination in difficult cases. He has met with objections to the posture in private practice.

The Treatment and Curability of Carcinoma Uteri.

In a paper with this title (*Münchener med. Wochenschrift*, 1890, Nos. 42 and 43) Hofmeier questions if the introduction of total extirpation of the uterus for cancer of the cervix has proved to be a decided advance in the treatment of the disease. In support of his position he cites the statistics of different German operators, showing that Kaltenbach reports 30 per cent. of his patients free from recurrence one year after operation, Martin 41 per cent., Olshausen 47.5 per cent. at the end of two years, and Schauta 47.3 per cent. He criticises the statistics of the Munich clinic—64.4 per cent. without recurrence two years after operation—since they are the same as those claimed by Leopold in 1887. Attention is called to the slight favor with which total extirpation is regarded in England and America, as compared with its popularity in France and Russia. The results obtained by Byrne by the use of the galvano-cautery (77 per cent. cured at the end of two years), and the combined results of Schröder's operation at the hands of Pawlik and the writer, are also alluded to.

The statistics of high amputation by Schröder and Hofmeier (45.2 per cent. free from recurrences after two years) corresponds closely with those of total extirpation, and therefore show that the radical offers no decided advantage over the partial operation. In both classes of cases it appears that nearly 50 per cent. of the patients in whom the diagnosis was made in the incipient stage of the disease were well two years after operation.

The writer next discusses the question whether it is a fact that the upper segment of the cervix is affected in cases of commencing epithelioma of the portio vaginalis. If this were true, total extirpation would invariably be indicated, but, in his opinion, this has not been satisfactorily proved anatomically.

PÆDIATRICS.

UNDER THE CHARGE OF
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EXTERNAL PARALYSES FOLLOWING DIPHTHERIA.

HAUSEMAN'S (*Rev. Mens. des Mal. de l'Enf.*, 1890) paper is unique in being a careful record of phenomena attending and following diphtheria in his own person. A severe attack of diphtheritic angina began June 19, 1887, false membrane covering both tonsils, the velum palati, the posterior wall of the pharynx to the entrance of the larynx, the œsophagus, and the nasal cavities. The temperature reached 104° F., and there was much albumin in the urine. The disease lasted four weeks. The first symptoms of paralysis were felt upon the right pillar of the velum on the eighteenth day. For the next few days there was much disturbance of sensibility. Then came a feeling of formication in the tongue which gradually increased, then inability to move the tongue freely, and finally total anæsthesia and paresis of the organ. Nervous troubles in other parts developed in a similar manner. Paræsthesia was absent only upon the velum and the top of the larynx. Following the paralysis of the tongue there was paralysis of the buccal mucous membrane, the lips, the cheeks, and then the whole figure. There was paresis of the mimicking muscles and the masticating muscles of the face. The senses of smell and taste lost their acuteness, but sight and hearing were unaffected. In the fifth week the second and third branches of the trigeminal were attacked, the facial, the glosso-pharyngeal and the hypo-glossal, then the vagus and the spinal accessory in the branches supplied to the larynx and œsophagus. The vagus of the heart and intestine was not involved, though there was at times acceleration of the pulse, with partial syncope. In the eighth week the upper extremities, the trunk, and the lower extremities were invaded, with the same succession of symptoms. There was no severe pain, but every day there were general malaise, intellectual depression, insomnia, and a sensation of heat but no rise of temperature. Paralysis of the external oculo-motorius caused diplopia and crossed images, involvement of the common oculo-motorius caused pupillary paresis and disappearance of a pre-existing myopia due to fault of accommodation. As to the hands, there was athetosis, but not if the will were brought into action to prevent it. The paralytic phenomena were at their maximum in the middle of the third month, at which time, however, there had been an improvement in the condition of the pharynx and face. Convalescence was established in the fourth month. The only treatment consisted in a tonic regimen. Massage was painful and hydro-therapy inefficacious. From this minute auto-observation the author concluded that two paths are to be distinguished along which the diphtheritic virus is propagated; one includes, by metastasis, the lymphatic and blood streams by which the disease reaches the heart, kidneys, and joints, the other is the track of the nerves, the virus progressing, by contiguity, from one nerve to another. The diphtheritic paralysis is probably a toxic neuritis without characteristic anatomical modification.

THE EPIDEMIC OF GRIPPE IN CHILDREN.

COMBY (*Rev. Mens. des Mal. de l'Enf.*, 1890) reports that of 218 children affected with this disease seen by him in the recent pandemic, 124 were girls and 94 boys. The youngest of these was seventeen days old, the oldest fifteen years; 48 were under two years of age, 76 from two to five years of age, and 94 from five to fifteen.

Forty per cent. of the children in Paris were affected with the disease. Apart from the general epidemic influence no particular cause could be attributed. The disease is evidently infectious, the germs being diffused by atmospheric currents. Its contagiousness is not clearly established, though it is probable. Relapses were not infrequent; recurrences during the same epidemic were not usual. The pathogenic germ of the disease has not been isolated, though in the concomitant diseases the pneumococcus was found with pneumonia, the streptococcus with otorrhœa, and the staphylococcus in the vesicles of labial herpes. The principal symptoms were referable to the nervous, the digestive, and the respiratory apparatus. At the beginning there was sharp headache for a day or two in the frontal region radiating to the orbit, and accompanied with photophobia. There were also restlessness, insomnia, and, in a few cases, nocturnal delirium. Convulsions occurred in only three cases. Then there were pains in the back, chest, and knees, less frequently abdominal pain, gastralgia, or enteralgia. After the disappearance of the nervous prostration, muscular weakness and anæmia continued a long time. In 98 cases there was vomiting, and in 38 nausea alone. In only 18 cases was there diarrhœa, constipation being the rule. Fever was constantly present, but showed no well-defined cycle. It usually began with a feeling of chilliness. The pulse was regular, frequently reaching 150 to 160 per minute. The urine was red, acid, contained water, but no sugar or albumin. Cough was present in a third of the cases, being usually due to pharyngitis or laryngo-tracheitis, rarely to bronchial catarrh. Coryza was present in 63 cases, epistaxis in 18, epiphora in 23. There were but few cutaneous manifestations, including labial herpes, urticaria, sudoral erythema, roseola, scarlatiniform erythema, and morbilliform erythema, and these in only a very small number of cases. Desquamation was not seen in a single case. Complications of the respiratory organs were few and benign, bronchitis appearing in 18 cases, and broncho-pneumonia in only 1. In 14 cases there was ocular disturbance, including 5 cases of simple conjunctivitis, 1 of hæmorrhagic conjunctivitis, 4 of vesicular conjunctivitis, 11 of vesicular keratitis, 3 of double keratitis. In 13 cases there was otitis media. There was also 1 case of tibio-tarsal arthritis, and 1 of catarrhal icterus. In general, there was an absence of grave complications in almost the entire series of cases. The period of incubation of the disease could not be determined. Its invasion was usually brusque, the febrile period averaging three days. Convalescence was usually of long duration. The following degrees of the disease were observed, which can hardly be considered as distinct forms:

1. The attenuated form, which was seen in 26 cases. The patient might be able to go about, but there was usually a temperature as high as 101.3° F.

2. The average form, which was characterized by decided febrile action, and intense pain. The patients usually remained in bed from one to ten days.

3. The grave form, which was seen in only four cases, and was characterized by high fever, great prostration, delirium, restlessness, and typhoid or meningitic phenomena.

In only one case was there a fatal issue. The diagnosis was usually easy, though in certain cases it was necessary to exclude variola, rubeola, scarlatina, typhoid fever, and meningitis.

For medicaments, quinine and antipyrine were chiefly used, also purgatives and emetics. When particular indications for other drugs arose, they were met as each case demanded. In addition, rest, light diet, and during convalescence tonic and reparative agents were used.

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TWO CASES OF SCLERIASIS.

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The cases here for the first time reported are chiefly of value from the long period during which they were under observation and from the fact that in both it was possible to make careful examinations *post-mortem.*

Case I.—Bridget H., aged forty-two years, was admitted to the Pennsylvania Hospital on March 15, 1865. She was born of healthy parents, having, so far as could be ascertained by the most rigid inquiry, neither syphilitic nor tubercular taint.

She herself had possessed good health until two months before her admission to hospital, having steadily followed her occupation as housemaid. She is unmarried, and it is impossible to fix upon her the slightest suspicion of ever having contracted venereal disease.

Two months ago her present illness began with swelling of the feet. This was soon followed by an induration of the skin about the ankles to a slight extent. Recently swelling of the hands appeared. This swelling extends from the tips of the fingers to the wrist, being less marked than that upon the upper portions of the feet. The skin of the parts involved is tense, resisting pressure and not pitting at all. The induration is much more marked in the hands than in the feet, this difference having existed since the beginning of the attack. She has lost almost all her teeth within the past four years from gradual decay, but her gums are firm. She can assign no cause whatever for the appearance of her symptoms. Until the onset of this trouble menstruation was normal, but ceased when it began. She has never suffered any rheumatic pains. Her general condition upon admission was poor. She was anæmic, with pallid lips, feeble pulse, and intensified second sound of the heart. The urine was of acid reaction, its specific gravity 1022, and containing neither albumin or sugar.

She was ordered nutritious diet and spiritus juniperi comp. f℥ss, t. d.

March 21. Swelling decreasing. Feels better.

24*th*. Less œdema of the feet, but both hands and feet are somewhat swollen and indurated. Given pil. ferri carb. gr. ij, t. d.

31*st*. Feet continue to improve, but hands are still hard and enlarged. Spiritus juniperi comp. discontinued, and potas. iod. gr. x, t. d., substituted for it.

April 2. She has complained more of her hands since the storm of the past few days. They are somewhat swollen, with very little if any augmentation of temperature. The skin is of a livid red tint and is assuming a glossy appearance over the dorsal surface of the fingers and hands. The hands are painful to the touch, and are very hard. Movement of the wrist-joints and fingers is considerably impaired, apparently not so much from any real stiffness in the joint as from the binding of the indurated skin. In addition to this induration of the skin and superficial tissues there is an entire loss of the normal supple play of the skin upon the subjacent structures, it being now impossible to pinch up a fold of skin or to push the skin from side to side. This condition is evidently due to an agglutination of the superficial and deeper layers of the connective tissue.

6*th*. The hands and feet have both seemed slightly better for the past two or three days, but the change consists rather in her sensations and in a little increased range of motion than in any real improvement. To-day the same indurated condition of the superficial tissues has appeared in the face over each malar bone with slight prominence of the cheeks. There are no abnormal heart sounds present, and even the difference between the first and second sounds above noted is less obvious. There is a slight venous hum in the left jugular vein. The respirations seem to be normal. Appetite fair. Tongue slightly coated. No abdominal swelling.

10*th*. The induration of the cheeks seemed less, but toward night they returned to their former condition without heat, pain, or redness. The carbonate of iron and potassium iodide were continued, and vin. colchici rad. gtt. xv, t. d., added.

24*th*. The skin is noted as seeming a little softened, especially on the face.

29*th*. Improvement did not continue, the skin presenting the same indurated, resisting character around the ankles, on the hands, and wrists. Beside these parts and the surface covering the malar bones—on body, thighs, and anus—the skin and subcutaneous tissues are as soft as ordinary.

May 12. The induration on the face and around the ankles is rather less, and there is now scarcely any pitting on the ankles. The condition of the hands, however, is growing more marked. The enlargement of the hands before mentioned has gradually subsided as the hardening of the skin increased, until now the fingers appear to be thinner than they were before the onset of her trouble. She has lost, to a great extent, power of motion in the fingers, which are somewhat flexed, the skin over the joints being very tightly stretched and shining, while in one or two points minute ulcerations have appeared. The skin over the dorsum of the hand is shining and discolored, and the induration has extended up a short distance above the wrist.

Sensibility in these parts appears to be unimpaired. She does not suffer much pain although the affected areas are somewhat sensitive to pressure, and when, from apprehension that some of the loss of power might be due to false anchylosis, forcible passive motion of the wrist and fingers was attempted, it gave exquisite pain and did not the slightest good.

Her general health is very good; but her hopes of recovery have pretty much disappeared, and she is dejected, somewhat irritable, or even hysteroid at times. She complains of great insomnolence.

16*th*. The local application, now applied since last note, seemed to have done no good, and was, therefore, discontinued, and baths of sulphuret of potassium tried. Internally she has been taking syrup. ferri iod. freely with cod-liver oil.

19*th*. Instead of the iron preparation she was now put upon a mixture of potas. iod. gr. v, hydrarg. chlor. corros. gr. $\frac{1}{12}$, syr. sarsaparill. comp., f ℥ss; t. d.

26*th*. No improvement whatever having taken place in the hands, although the feet and face were very slowly improving, the oil and mixture of May 19th, as well as all local applications were discontinued and she was ordered liq. potas. arsenitis gtt. v, t. d. After taking a few doses of the arsenical she was seized with symptoms of gastro-intestinal irritation—frequent vomiting and purging, burning and stinging pain in the epigastrium. The drug was immediately stopped, and castor oil, demulcents, and counter-irritants used. She slowly regained her previous condition, her stomach becoming tranquil, and her digestion improving under the use of tr. cinchon. comp. The condition of the hands and wrists remain exactly the same.

July 20. The arsenic was resumed in three-drop doses, largely diluted.

After continuing its use for nearly a week the drug had to be discontinued owing to the recurrence of her gastro-intestinal symptoms. She was then put upon a simple carminative mixture.

August 9. She still suffers a great deal from gastric distress with quite frequent vomiting. Has lately been complaining severely of pain in the shoulders, apparently in deltoid and trapezius muscles, for which hypodermic injections of morphia were given.

September 5. She is no better, continuing to vomit frequently at times for days consecutively. She also complains of a gnawing, burning pain in the left hypochondrium over the stomach. Her appetite is very poor. The matters vomited invariably consist simply of the food taken. Her bowels are regular. For some weeks past she has been emaciating quite rapidly. There is no sign, however, of cancerous disease of the stomach or pancreas—the epigastrium presenting no tumor. She still complains of pain in the shoulders, of depression of spirits, and of insomnia, which scarce any remedy will relieve.

The induration of the skin over the hands and the lower part of the forearms, with contraction and thickening of the fingers, is even more marked, and power of motion more impaired than formerly. The induration of the face has almost disappeared, and the œdema of the ankles is very slight, only a moderate feeling of induration remaining.

At this date she was transferred to the Philadelphia Hospital, where she was under the care of Dr. John Parry, who kindly supplied me with the remaining notes of her case up to the time of her death.

For several months after her admission to the Philadelphia Hospital she remained in very much the same condition, both as regards her general and local symptoms. Her emaciation and debility however increased so that before the close of the year she was compelled to remain in bed almost constantly. Premonitory symptoms of delirium appeared on about January 20, 1866, and within a few days she became completely out of her mind. Her delirium was not at any time violent—consisting in attempts to get out of her bed and wander about her room in search of imaginary persons—as, for instance, her mother, who had been dead for many years, but whom, she asserted, she frequently saw by her bedside. During this time there were no marked febrile symptoms nor any impairment of motility or sensibility. She still vomited frequently shortly after eating.

She never entirely recovered intelligence, and, although during the early part of March she would answer questions occasionally, failed entirely to recognize one of her former physicians. The induration and contraction of the hands progressed until the skin became involved up to the elbow—not, however, to so great an extent as before—while above the elbow it remained soft. The induration of the lower extremities had also extended, involving the lower half of the leg. At no part was the skin so dense and resisting, or the contraction so great as on the hands and wrists. During the last few weeks of her life there was considerable œdema of the ankles, in spite of their indurated condition. Early in March she began to fail rapidly, apparently from some intercurrent disease, and death occurred on March 14, 1866, just one year from her admission into the Pennsylvania Hospital and about fourteen months from the inception of her disease.

During the days immediately preceding death a partially gangrenous condition of the tips of several toes appeared, while in the upper extremities complete dry gangrene of the last two phalanges of the index-finger of the left hand occurred. Even at this final stage there was no ulceration of the indurated tissues. The small ulcerations, mentioned above as existing on the joints of the fingers, were scarcely more than abrasions, and, after throwing off repeated thin crusts, gradually dried up.

Of the *autopsy* the following notes were made: Body extremely emaciated and the dependent portions ecchymosed. There is very little *rigor mortis.* Hair very gray and falling. Teeth all absent but two. No enlargement of external lymphatic glands in any part. Blood too fluid, forming only very soft, dark, and small clots.

Spinal cord was not examined.

Brain: There is congestion of the vessels of the convexity, but the membranes are clear. The membranes at the fissure of Sylvius, particularly on the left side, are thickened and opaque, with a few small granules on their surface.

The velum interpositum and the membranes over the postero-inferior part of the brain near its fissures are also thickened and in places somewhat granular, while the arachnoid along the anterior surface of the medulla is opaque and shows a few small whitish specks or granules underlying it. There are, however, no evidences of recent inflammation, there being very little effusion at the base and no abnormal effusion into the ventricles. The brain substance itself is of fair consistence and not congested. Upon removing the calvarium a small amount of serum escaped, but it was clear and trifling in quantity.

The granules above mentioned had undergone calcareous deposition in part, and under the microscope did not give perfectly satisfactory appearances of tubercle, there being but a few granular corpuscles mixed with granular calcareous matter and fibrillated tissue. The appearances, however, rather favored the view of retrograded tubercular deposit. It is to be much regretted that an examination of the spinal cord could not be made, as the opacity of the membranes along the medulla spinalis so far as it was removed, would tend to render the view of spinal lesion probable.

Thorax: The right lung is tied down by close chronic adhesions. In several places these adhesions contain little granules, which however are highly pigmentary. (The microscope showed these to be merely pigment and granular fibrous stroma, possibly originally of tubercular origin.) The lung itself is dense and congested but contains no tubercles. Along the bronchial tubes here and there are seen small pigmentary granules.

The left lung is compressed by effusion into the pleural sac, but is itself healthy save for marked congestion and condensation of its tissue. The pleural cavity contains about three pints of yellowish serum, rendered turbid by numerous flocculi of lymph. The heart is healthy so far as its muscular substance and valves are concerned. The pericardium presents signs of recent inflammation, containing shreds of lymph and several ounces of turbid serum. The membrane shows several patches of thickening and opacity.

The bronchial glands are much enlarged, forming tumors one and one-half inches long, and firm. On section they are found to contain much pigment and little collections of whitish granular matter, many of the granules having undergone calcareous degeneration. These appeared to be retrograde miliary tubercles.

Abdominal contents: The stomach is distended, its mucous membrane somewhat thickened and discolored, but not ulcerated. The intestines are normal.

The liver is rather small, quite smooth on its surface. On section it presents marked nutmeg appearance from hepatic congestion. The gallbladder is moderately full and contains one stone of about the size of a large pea and composed of translucent cholesterine. There is no hepatic cirrhosis.

The spleen is firmly adherent to the left edge of the left lobe of the liver, being drawn from its place by strong adhesions. The capsule is greatly thickened and very irregular, either forming whitish depressed cicatricial points or strongly adherent as mentioned above. It has evidently undergone a severe attack of inflammation of its investment. The spleen is small, of unusual shape, its tissue softened, its pulp of a grumous tending to reddish-slate color. There is a supernumerary spleen in the normal position, of about the size of a cherry with smooth capsule and firm healthy tissue.

The kidneys appear healthy and there is no disease or unusual condition of the supra-renal capsules. The inguinal, lumbar, and mesenteric glands are not enlarged.

The ovaries are full of cicatrices. The uterus is of normal size, the os is virgin, and there is present a slight cervical leucorrhœa.

The lower extremities present a few points of incipient gangrene at the tips of the toes, some œdema of the ankles, and a moderate amount of induration of the skin half-way up to the knee. [Dr. Parry stated that this was less than before death.]

The upper extremities are in the condition previously described, the induration reaching almost to the elbow and still marked, although less so than before death, while the livid redness of the skin then seen has disappeared. The wrist is forcibly extended and the fingers partially flexed. All of the tissues are much contracted and thinned, having a smooth, glazed feel and appearance. Gangrene of the index-finger exists, as described in the notes taken during life. The condition of the vessels and nerves could not be determined owing to the lack of permission to dissect them out; but pieces of skin were removed from the palmar surface of the forearm above the wrists, the parts being removed down to the bone.

The muscular structure is not materially changed, although a little pale and containing an unusual amount of interfibrillar granular matter. The skin itself is slightly thickened, but does not feel so dense as before removal, the cause of the induration and contraction being evidently the condition of the subcutaneous connective tissue.

This tissue is dense, of a pearl-gray color, with a smooth, almost colloid appearance. There is no line of division between the superficial and deep layers of connective tissue, but from the skin down to the tendons and muscles there is a uniform layer of the above appearance, dense and measuring about one-eighth of an inch (in places probably not more than a twelfth) in thickness.

On examining a section the epidermis appeared healthy, the ducts were pervious, and the hair-follicles distinct. The hairs appeared brittle and broken. The subcutaneous tissue was dense, and consisted of closely interwoven bands of fibrous tissue. There were no exudation cells seen. The connective-tissue layer was spotted with points of adipose tissue, which, however, did not form anything like a continuous layer. It also seemed that the deeper layer of the derm had an unusual amount of fibrous tissue.

Case II.—Michael M., aged forty-two years, came under observation August 21, 1867. He was a native of Ireland, but has been in America twenty-four years. Both his parents were dead; his mother was thought to have died of phthisis. He had six brothers and sisters, all of whom were living and well. His principal occupation had been that of a hack driver, in which he had been much exposed to cold and wet, but had enjoyed excellent health.

On the evening of January 9, 1866, a day when the mercury fell to 9° F., after driving all day with a pair of new and rather tight gloves on, he noticed that the ends of his fingers felt cold and numb. On dipping them into cold water a burning sensation was felt, and the same sensation was caused by approaching the fire. His companion had his ears severely frosted in the ordinary way and soon recovered.

The patient's fingers did not swell and become hot on the following day, but instead remained cold at the tips, with impaired sensibility and a feeling of numbness, and with a burning sensation for two months, during which time he continued his work without interruption. At the end of this time both hands and arms began to swell from the tips of the fingers almost to the elbows. The swollen parts were unusually white, hard, not pitting on moderate pressure, but when indented by firm pressure a slight mark would remain for some time. The surface was smooth and somewhat shining. Sensibility was blunted, but not destroyed; no subjective sensations present; cold did not produce a sensation of burning above the fingers. This swelling continued for two months and then began to abate. The hands, that had been almost immovably fixed in a semi-flexed position, became somewhat more supple and the skin rather less pale. This contraction continued until the arms became much reduced in size. About seven months after the first symptoms, he noticed induration over the lower part of the sternum, and began to feel stiffness of the upper part of the trunk, so that he could not stoop. Soon after this he was obliged to abandon work.

The affection of the skin of the thorax was preceded by induration of the skin of the humeral regions, which became very hard and swollen like that of the forearm. The induration extended from the sternal region over the whole anterior part of the thorax and up over the clavicle and on to the neck. Soon after he noticed it in the lower extremities, affecting the feet first, but to a less degree than the skin between the ankles and knees.

The capillary circulation seems to have been much interfered with from the beginning. In January, 1867, one year after inception of the disease, he accidentally cut his finger, when to his surprise no blood flowed.

About three months before admission he began to have a feeling of creeping under the skin of the forehead and of tingling of this part, which was worse at night, causing him to scratch the surface continually. This feeling had been present in the arms, but no where else. The induration has since then involved the skin of the entire head and face down to the level of the mouth.

When first seen, August 21, 1867, his condition was as follows: There is marked induration of the skin of the whole head and face from the vertex down to the level of the mouth, the constriction and hardening being most marked over the frontal protuberances, malar bones, and the bridge of the nose. It is still possible to slightly indent the skin on the forehead, and such a mark remains a long time. The scalp and skin of the face is of a peculiar white, waxy appearance, with the cutaneous veins distinctly visible. The temporal arteries can be felt pulsating, though their calibre seems small.

Over the entire anterior part of thorax the skin is indurated and more white, waxy, and shining in appearance than elsewhere. It feels as though tightly stretched over the ribs, and so great is the tension that when he draws back the scapulæ and arms he says it seems to him that the skin will rupture over the sternum. The induration and constriction do not extend beyond the lateral aspect of the chest, but extend up over the clavicles for a short distance on to the neck. The skin over the shoulders is also indurated, and when the deltoid muscles are contracted and the arm raised there is an appearance, for two fingers'-breadth below the acromion, as though the muscular substance of the deltoid was much atrophied, leaving merely the fibrous bands connecting with the bones, as though the deltoids took their origin by numerous converging tendons.

At one time he was unable to raise his arm more than 45° from his body, and would then feel a sense of constriction in the fold of the axilla, but this has of late diminished, and he is now able to raise his hand to the head.

The induration on the humeral regions has also diminished during the past four months and is now limited to the external aspect of the arms, and is much less marked even here than on the forearms.

The skin on the forearm is markedly indurated, and the entire forearm is much reduced in size.

The skin of the hands is very hard and immovable, as though united with the deeper structures. It is also a good deal discolored, that on the back being principally of a dull-whitish color, while the fingers are brownish. The fingers are permanently semi-flexed and can neither be completely flexed nor extended; there is, however, no anchylosis of any of the joints nor erosion of the cartilages, but upon forcibly moving the fingers the flexor tendons give a sensation of rubbing and creaking through their respective sheaths. The hands also feel decidedly cold. The epidermis has twice separated from the hands, owing, he believes, to irritating applications.

The skin of the abdomen is slightly indurated: that on the back being the only part entirely free from the disease.

There is a moderate degree of induration of the skin of the feet, which, however, becomes much more marked between the ankle and knees, diminishing again from the knees up to the hip.

There is no ulceration on any part of the body, although the skin over several prominent bony points, especially the internal condyles of the humeri, and some of the phalangeal joints of the fingers, is very tightly drawn and glazed.

Sensation to pain is acute, and common sensibility appears good everywhere; there is no analgesia.

For the past seven months his bowels have been somewhat constipated, and during much of this time he has vomited one, two, or three times daily. The vomiting occurred soon after eating, the matters rejected consisting principally of the food taken. He has noticed also six or seven times that the matters vomited resembled coffee-grounds, but he has never seen any blood in them. For the past four months he has had a good deal of cough, which has been most marked at night when occasionally he had violent paroxysms. The cough has been attended for two months past with muco-purulent expectoration, and a few days before admission he raised a little blood-tinged mucus for the first time.

Physical examination revealed good resonance on percussion over the entire thorax. Respiratory murmur feeble postero-inferiorly, with prolonged expiration and a few dry râles; elsewhere it was normal. There were also a few old friction sounds.

The apex beat of heart was at the sixth rib, three-fourths of an inch to the left of the nipple. There was no considerable increase in the area of cardiac dulness. The cardiac sounds were normal, save that the first sound at the apex was rather heavy and prolonged. Pulse regular, 88 in sitting posture after physical examination. The tongue was pale, but moist and clean. He is not able to protrude it, nor can he open the mouth widely. There is no gingival margin in the gums; nor any induration of the mucous membrane of mouth. Ordered ung. iod. comp., cerat. simp. āā. Apply to surface twice daily. ℞. Potass. iod. gr. v, ext. dulcamara f℥ss, M.; t. d.

This treatment was continued for a few days only, as he insisted upon leaving the hospital to return to his wife and children, and for the next two months he was without medical attendance.

On October 6, 1867, he was found in much the same general condition, though in some respects he was decidedly improved. Appetite not strong, but vomiting much less frequent and little or no eructation of gas. Bowels costive, requiring laxatives every second night; he uses senna and manna, which operate very nicely. He has considerable thirst, especially at night, when he rises several times to drink. He also passes more urine than natural, and is disturbed on this account several times during the night; the urine is, however, quite healthy, containing neither albumin nor sugar. He has some cough during the early part of the night, with tough muco-purulent sputa. He is much stronger than previously, and is now able to walk several miles without much exertion or fatigue. His weight before his sickness was 185 pounds, three months ago it was 102 pounds; at present it is 115 pounds.

Most of the surface feels of a comfortable temperature; he always feels cold after the slightest exposure in the last two phalanges of all his fingers, and these parts then become purplish.

The surface was at first unnaturally white, and the face is still pale, but the neck which, three months ago, was white and so hard that the skin could not be raised in folds, has now become softer and darker colored, having a brownish tint over the whole front part. This coloration is not uniform but is interrupted by little patches of light-colored skin; in some places the pigment seems deposited on the ridges of the skin alone.

When the head is flexed the skin of the front of the neck is quite pliant and movable, but when extended it is seen to be very tense and numerous thin bands can be seen passing from the clavicles and sternum to the lower jaw. At the same time the skin for an inch and a half above the sternum becomes rough and nodulated as though crossed by subcutaneous bands which prevented it from stretching equally and smoothly. He is quite bald over the vertex, but this has been the case for some years, and the hair in other parts does not seem at all inclined to fall out.

The scalp is very white, glistening, and waxy in appearance, it is very slightly movable (cannot be thrown into wrinkles), and feels thick, hard and waxy. Firm pressure with the finger causes a slight indentation, as in firm wax, which remains a long while, at least for two hours.

The skin of the face is uniformly affected. Over the forehead it is drawn tightly, glistening with a waxy lustre, and cannot be thrown into wrinkles by any effort at frowning nor at all pinched up in folds, so slightly movable is it over the bone. The skin over the malar bones is also tightly drawn and indurated.

The alæ of the nose are thin and the nose has a pinched appearance. The angles of the mouth are somewhat retracted and the upper lip drawn up, partly uncovering the teeth. The lower lip and region of the chin are also hard. The upper eyelids are decidedly indurated, and it is only with effort that he can cover the eyeballs. In this condition the face is almost immobile. His efforts to smile produce no wrinkling of the cheeks or movement of the skin over the malar bones, but merely a little additional separation of the lips. The expression of the face when the eyes are closed is that of a death's head with a skin of peculiar glistening, waxy appearance, stretched tightly over it. The tongue does not seem involved, though its movements are not very free. The gums are contracted, hard and pale. The mucous membrane of the oral cavity does not appear to be involved.

The skin over the mastoid processes seems very thin and hard. The ears cannot be moved so freely by the fingers as usual owing to the condition of the surrounding parts. The external ears are, however, certainly the least affected of any parts of the head, and it is indeed only the lobes which can be said to be at all involved, the affection here amounting to a little rigidity.

The skin in the armpits is of a deeper color than natural, and there is a brownish-yellow mottling over the lateral regions of thorax and abdomen. The skin on the inside of the arms is also of abnormally deep color down almost to the elbows. There is scarcely any induration of the skin of these parts. The hands present the same brownish-yellow mottling, which is most marked on the back of the left hand, which is also softer and more movable than the right. The central part of the back of the right hand is still very pale The capillary circulation of the skin appears very sluggish. He can now raise his arms to the level of the shoulders, and place his hands on his head.

The following measurements were accurately taken :

Around right wrist, 6 inches ; around first phalanx of right index finger, 3 inches ; around second phalanx of right index finger $2\frac{9}{16}$ inches ; around right forearm, 3 inches ; below olecranon, $7\frac{5}{8}$ inches ; around right arm, at insertion of deltoid, $7\frac{5}{8}$ inches ; around neck, on level of fifth vertebra, $11\frac{1}{2}$ inches ; around neck, on level of sixth vertebra, $12\frac{1}{4}$ inches ; around calf of right leg, $11\frac{5}{8}$ inches ; around right ankle, $8\frac{3}{8}$ inches ; extent of ability to open mouth, $1\frac{1}{2}$ inches.

He was now ordered pulv. opii gr. $\frac{1}{3}$, quiniæ sulph. gr. j ; t. d.

November 11, 1867. Has continued above treatment, and feels in every way better. The hands are a little more supple ; he can move his arms rather more freely and open his mouth a little more widely. He walks slowly, but can accomplish considerable distances without much fatigue.

On pricking one of his fingers, a drop of blood was obtained, though with more than natural difficulty. It appeared to cause him unusually great pain. (The sensation felt in sticking the pin into the flesh was as though it entered a dense lardaceous tissue.)

He still suffers from gastro-intestinal disturbance, and vomits almost every day and on some days several times. The vomiting rarely, if ever, occurs spontaneously, but follows eating at intervals of from twenty minutes to several hours. The matters vomited consist of the ingesta with gastric mucus. There is also belching and a foul taste in the mouth. The bowels are costive, for which he uses senna and manna once in two or three days, which operate rather freely even in moderate doses.

Urine has been less free, not requiring him to leave his bed more than once in the night.

The powders of opium and quinia were discontinued, and he was ordered subnitrate of bismuth gr. v, t. d.

21*st*. One week ago he raised about two fluidounces of pure blood, probably from the stomach, and since then has been troubled with a sense of constriction about the chest and quite frequent cough, with mucoid expectoration. His strength, however, is rather improved ; his appetite is better and his dyspeptic trouble is less, though he still suffers with gastric distress.

December 1. Vomiting so much relieved that bismuth was stopped and he was ordered ferri iodid. gr. ij, t. d.

10*th*. A crop of vesicles broke out without any apparent cause on the left hypochondrium and rapidly spread, assuming the form of herpes zoster, and extending in the course of a week more than half around the trunk, forming a band nearly four inches wide. The vesicles were *flattened*, filled with turbid serum, and were seated in irregular clusters on a livid-red base. The eruption itched very severly, and he believes that its appearance was attended with relief to gastric symptoms.

The pills of iodide of iron were continued, a laxative pill of ext. colycynth. comp. and ext. gentian ordered, and cerate zinci carb. applied to the eruption, which rapidly improved, and was quite well in less than three weeks.

January 2, 1868. Has been very unwell for several days past. The laxative pills have been insufficient, and he has been obliged to take purgative doses of senna and manna. Appetite has been very poor, and he has suffered severely with flatulence and vomiting. The vomiting does not occur until an hour or more after eating, and is accompanied by the eructation of very large quantities of gas of not very offensive character. At times this eructation is the only phenomenon and affords great relief. His tongue is rather pointed and its surface rough, but not actually furred. There is quite marked tenderness over a space about three inches in diameter, extending from the middle of the epigastrium toward the left.

The skin of the abdomen is indurated and the abdominal walls are quite hard; cannot be raised in folds and imparts an inelastic, leathery sensation. There is no positive tumor or localized induration in the neighborhood of the pylorus, though palpation is rendered difficult by the condition of the abdominal walls. He is progressively emaciating, and the induration of the surface is certainly little, if any, less marked. The skin is now much discolored in places by yellowish-brown spots, roundish, of small size, rarely exceeding two lines in diameter, and in very many instances seated around the orifices of hair-follicles. This is marked over the inguinal and iliac regions, extending also on the lateral parts of the abdomen as high as the ribs. On the thorax the skin has a white, waxy appearance; on the hands and forearms, again, it is much discolored. On the hands alone this discoloration takes the form of irregularly shaped, brownish blotches. This discoloration of the skin is a phenomenon entirely due to the cause of the disease, as previously to its beginning his surface was quite white. The patch of herpes zoster is quite well.

The hair on his head is not abundant and has not been for many years; it is quite long, straight, and black, and can now be plucked out with certainly less than the usual amount of force. The hairs on the forearms have, as is often seen, a broken, distorted appearance, which seems even exaggerated in this case; and here also they can be readily plucked out, and with production of scarcely any pain.

The temperature of the surface, excepting the tips of the fingers, is apparently normal. For the past two or three days he has sweated considerably. The iodide of iron was stopped on account of the extreme gastric distress, the laxative pills continued, and he was ordered argenti nitrat. gr. $\frac{1}{8}$, t. d.

25*th*. Has continued use of nitrate of silver since last note, but without any benefit to gastric symptoms. He still continues to vomit once or twice daily, the vomiting occurring a few hours after meals. The matters vomited consist of gastric mucus with undigested food, and contain neither blood nor sarcinæ ventriculi. Bowels still costive. Induration of skin about the same. Emaciation not progressing.

February 27. In much the same condition as regards the degree of emaciation, induration, and freedom of movement. There seems to be some decrease in the discoloration of the skin, especially on the hands and arms. He occasionally sweats. Temperature of surface usually seems normal; but during the late intense cold he has required much artificial heat. Appetite poor, and he still suffers from gastric flatulence, burning epigastric pain which does not extend through to scapula, and frequent, irregular vomiting. The matters rejected are the same as before.

For about four weeks he was placed on a diet of two pints of milk daily with a little lime-water, but this afforded no relief. He has now taken nitrate of silver for eight weeks, as first, gr. $\frac{1}{8}$, t. d., and for past two weeks gr. $\frac{1}{4}$, t. d. This remedy has certainly not relieved the gastric symptoms, but on the contrary, after the latter large doses he had marked burning pains and vomiting was more frequent. For a few days after stopping it he scarcely vomited at all. There has been for some months past slow progressive diminution in the induration, though so slight as scarcely to be positive, and as this has not been more marked during use of nitrate of silver, it is, on the whole, doubtful whether this remedy has been of any service at all. Stopped nitrate of silver and ordered liq. potass. arsenitis gtt. v, t. d.

March 7. After continuing this for eight days he became universally œdematous, the face more swollen than the extremities. There was marked dyspnœa, with almost complete extinction of the voice and sense of constriction in the larynx, probably from œdema of glottis and larynx. There was also marked gastric distress and almost constant vomiting. He was not seen on the day when these symptoms were worst; the arsenic was stopped and the œdema rapidly subsided. He also used for a day or two diuretics and strong alum gargles.

Unfortunately, the urine could not be obtained until twenty-four hours after the arsenic had been stopped, and when the œdema was already diminishing, but at that time no albumin was present.

After this unfortunate attack he continued to be troubled with spasmodic cough and very frequent vomiting, which were greatly relieved by spiritus chloroformi. This soon lost its controlling power, however, and was stopped; and for some time he took merely occasional laxatives and small, frequently-repeated quantities of milk and lime-water.

May 1, 1868. Since last note his general condition has been growing steadily worse and his strength failing. The induration has, however, remained about the same, though he says he has more power of movement. There has been little or no loss of hair since previous note.

The tissues of the neck are still indurated, and when the head is thrown back the same subcutaneous bands can be seen as previously. There is some brownish-yellow mottling of the skin of this part.

The induration is very marked over the inner half of the clavicles and the whole sternal region down over the epigastrium. There is no discoloration of the skin here, but there are two small oval patches about one-half by one-third of an inch below the right sterno-clavicular articulation, where the skin is dead-white.

The condition of the face is the same as before noted, save that he can open his mouth more widely.

The anterior surface of the abdomen is decidedly affected throughout its entire extent. The skin cannot be pinched up from the muscles, but one is required to grasp a large fold of the entire thickness of the abdominal wall. It has not, however, advanced to the extent of inducing any manifest constriction of the abdomen. There is very marked yellowish-brown mottling of the skin on the antero-lateral parts of the abdomen, extending down over the iliac regions on to the outside of the thighs. The spots are quite closely placed, and vary from small points to patches one-third of an inch in diameter. There are no patches of dead-white color on this part of the body.

There is rather more power of movement of the arms, and he can now readily place his hands upon the head, though the forearms are constantly flexed at an angle of about 40° with the arm from tension of the skin above the elbows. He is able to flex them more than this, but cannot extend them further.

The deltoid muscles are much atrophied, and when the arms are raised the same tense bands are seen starting from the acromion, as though the muscular substance was almost removed for one and one-half inches below it. The skin over the shoulders is indurated.

The skin of the humeral regions is but little affected, most so on the antero-external aspect. The discoloration already noted on the inner surface and in the axillæ still continues.

More marked induration begins on the forearms and extends, constantly increasing, down to the tips of the fingers. The deep structures of the forearms are evidently much atrophied. The induration and constriction are extreme about the wrists, and there is scarcely any mobility of the hands upon the forearms. The tendons can be felt to move with difficulty, and a rough rubbing through their bursæ under the capsular ligament. The hands are shrunken and have a waxy, shining appearance; the fingers are constantly separated from each other and about half flexed. Some motion still exists in the metacarpo-phalangeal joints, but scarcely any at the inter-phalangeal. The skin over the hands and fingers is hard, smooth, thick, and absolutely immovable over the bones; over the phalangeal joints it has a somewhat translucent appearance.

The skin on forearms and back of hands presents a marked yellowish-brown mottling; over the fingers it is of an almost uniform brownish tinge, excepting a few white spots such as below described; on the palms of the hands it is of natural color and merely anæmic. The discoloration is much more uniformly dark on the back of the left hand, with fewer white spots. The white spots alluded to are placed as follows: There is an oval, slightly depressed patch, about one and a quarter inches long by half an inch wide on the posterior surface of the right forearm; there is another similar large patch over the palmar surface of the right carpus, and a third patch, one inch in width, is seated on the back of the right hand just above the ends of the metacarpal bones of the middle and ring fingers.

The skin on all these patches is dead-white in color, smooth and waxy-looking. In at least one of them it appears somewhat depressed below the surrounding skin. It is very thick and hard, but there is neither tuberculation nor puckering present, so that the patches do not possess a really cicatricial appearance.

There is a condition of chronic erythematous redness over the olecranon process of the ulna on the right side, with a superficial dry scaly abrasion of the skin over the internal condyle. On one finger of each hand there is, at the articulation between the first and second phalanges, a small depressed ulcer, with dry scaly surface, which gives rise to much pain of a burning character.

On the lower extremities, the antero-external parts of the thighs are moderately affected over the lower half; the induration is more marked over the legs, and especially their anterior surface. On the feet the induration and contraction are still more marked, and hinder free movement of the ankles. When in the recumbent posture he always keeps the legs much flexed. The skin of these parts is thick, waxy in appearance, and but slightly movable; there is, however, neither discoloration nor ulceration. For some time past he has suffered with coldness of the extremities; sensibility does not appear to have become further impaired.

Since last note the vomiting has persisted, being very frequent, and occurring at times almost instantly after taking any food at all into the stomach. He states also that the matters vomited have occasionally been very dark. There is now a decided prominence in the epigastrium, indurated and very painful on pressure. There is also dulness on percussion at the epigastrium. Ordered subnitrate of bismuth gr. xx, t. d; and tr. iodine and tr. belladonna āā, to be applied to epigastrium. The vomiting was relieved for a few days, but his strength continued to fail rapidly, and on May 5, he had a sudden sinking spell, attended with the appearance of collapse, coldness of extremities, suspirous breathing and feeble frequent pulse. This was immediately preceded by a feeling of great præcordial and epigastric oppression amounting to a sense of suffocation.

Quite frequent discharges of dark semi-fluid fæces occurred, and vomiting again ensued of coffee-ground matter, containing very many forms of squamous epithelium, round granular cells, numerous altered blood globules, a few muscular fibrils, oil, and granular matter. Marked epigastric pain and tenderness persisted, with some sense of induration in this part.

Active external stimulation with use of nutritious and stimulating enemata, and administration of sulphate of quinia and tr. ferri chloridi by the mouth procured a partial reaction. He continued, however, to vomit and pass by stool dark bloody matter; his feet and hands again became very cold and blue; the pulse was barely perceptible in the radial arteries, and an abundant cold sweat bathed the entire surface.

The feet became painful on pressure and ultimately gangrenous up to the metatarso-tarsal joints; the fingers grew very cold and purplish, and the distal half of the penis became gangrenous also. He lingered until May 18, thirteen days from occurrence of the hæmorrhage into the stomach, without suffering much but slowly passing into a comatose condition. He could scarcely be made to swallow, but the entrance of the least morsel into the stomach induced instant vomiting. He was also troubled with frequent cough, the act of coughing appearing difficult, and throughout the lungs there were numerous fine crepitant râles of œdematous congestion.

A day or two before death the surface became slightly yellowish and a large cluster of purpurous ecchymoses appeared over left hypochondriac region, where the herpes zoster was formerly seated.

Post-mortem examination, forty hours after death : Rigor mortis extreme. None of the discoloration of skin described as existing during life has disappeared. Body much emaciated. Skin of a waxy hue, and induration even more marked than during life. Features composed and tranquil, but eyelids would not remain closed tightly.

Owing to the circumstances under which the examination was conducted, it was utterly impossible to examine the spinal cord or brain, or to pursue any careful dissection of the affected extremities.

Nervous system : The cervical and abdominal ganglia of the sympathetic, portions of the right phrenic and pneumogastric, of the right brachial plexus, and of the median in the forearm were removed for examination.

The second ganglion on the left side was found to be about the size of a small pea (one-fifth of an inch long and one-twelfth of an inch wide), of quite bright pink color, and elastic firm consistence. A small fragment of it required teazing with needles, as quite firm fibrous tissue would.

Microscopically, the nerve cells were found in abundance, but few of them showing polar prolongations. In many of them the granular contents formed quite a large patch, leaving, however, the nucleus distinct; but in some others, not very numerous, the entire cell was filled with shining granules, not very minute, which obscured the nucleus. The sympathetic nerve fibres were found apparently healthy. In portions of the ganglion there was quite a large amount of fibrous tissue in wavy, intersecting bands traversing its substance and separating the cells.

On the right side the third cervical ganglion was examined and found to be irregularly rounded in outline and flattened, about one-fourth of an inch in diameter. The structure of this ganglion was decidedly more tough and fibrous than that of the superior ones and offered much more resistance to efforts to teaze it out. Its color was grayish-pink. It was quite firmly adherent to surrounding tissues, which consisted of dense indurated connective tissue. On microscopic examination the cells were found apparently quite normal in many instances, while other cells exhibited an excess of granular contents obscuring the nucleus. The fibres of Remak and sympathetic nerve fibres could be readily made out, but there seemed to be a marked excess of dense fibrous tissue, lying between the cells and nerve fibres, and appearing as wavy bands of varying width (of wavy white fibres). The addition of acetic acid cleared up such fields to a marked extent, and rendered especially the fibrous tissue transparent, revealing numerous oval nuclei occupying its position.

The nerve entering this ganglion was one-fifteenth of an inch thick, had a distinct capsule, and a microscopic examination of its fasciculi showed the presence of a considerable amount of fibrous tissue between the individual nerve fibres.

The second cervical ganglion was found to correspond closely in size, color, and consistence with its fellow.

The solar plexus was carefully dissected out. One of the ganglia connected with it was selected for examination, and found to be very firm, grayish-pink in color, and although numerous cells corresponding with those described above were found, there appeared to be here also an excess of fibrous tissue.

So far as could be determined from these examinations, therefore, it seems as though comparately slight and unimportant changes had occurred in the ganglionic nerve cells; while the neurilemma of the nerve fibres traversing the ganglion and the intervening connective tissue had undergone morbid increase. It will be seen that this corresponded with the condition of the nerve trunks elsewhere.

Right phrenic nerve was apparently unaltered.

The pneumogastric was decidedly more rigid, its fasciculi strongly adherent to each other, and on examination there was found to be an excess of fibrous tissue intervening between the nerve fibres. The myelin appeared in very tortuous lines, and nerves were highly granular.

Several portions of nerve from the right brachial plexus were examined and found to present a similar, unnaturally rigid condition, with excess of fibrous tissue on microscopic examination.

A section of the right median nerve extending from the carpus one and a half inch upward was removed. This was quite rigid and hard; a condition which was still better appreciated on rubbing a transverse section. The sheath of the nerve was not materially thickened; the fasciculi were very firmly adherent to each other, and measured on an average one-thirtieth to one-twenty-fifth of an inch. The color of the nerve after removal of its sheath was a pure white.

Each fasciculus consisted of a sheath of neurilemma composed of dense connective tissue, and a core of less pure white color about one-fortieth of an inch in diameter; the thickness of the sheath thus amounting to rather more than one-quarter that of the whole fasciculus. On carefully teazing out this central portion there was still found a moderate amount of fibrous tissue interposed between the individual nerve fibrils, as though from thickening of their neurilemma. The double contour of the fibrils was preserved; the myelin readily broke up into drops, and both the axis cylinder and white matter of Schwann were distinctly granular. In one or two places groups of large nucleated cells resembling fibro-plastic cells were seen in inter-fascicular tissue.

The examination of all these parts of nervous tissue was made about twelve hours after removal from the body, having been kept in the meantime in water.

Lymphatic glands: The cervical lymphatic glands were all unusually hard. The upper were but slightly if at all enlarged, and presented microscopically the normal cells of the gland, with a large number of fusiform fibre cells. Toward the base of the neck, however, several glands were found, and especially on the right side, which were very much enlarged and of an almost cartilaginous hardness. There were two or three of these adherent together, forming an obtusely pyramidal mass about one and one-half inch long and three-quarters of an inch in thickness. On section this showed a very large amount of pigmentary deposit, with numerous quite thick trabeculæ of fine fibrous tissue traversing its substance, some of which were the thickened capsules of the adherent glands, but others were newly formed and due to a very great increase in the normal stroma of the gland. No other glands were found much enlarged, though all that were observed seemed more firm than usual.

Muscular system: Portions of the heart, the right pectoral muscle, the right crus of the diaphragm, and muscles of the right forearm were removed for examination.

Heart presented a moderate degree of eccentric hypertrophy. The right cavities were distended greatly with fluid dark blood, which was so frothy from decomposition as to render the right auricle slightly tympanitic on percussion. The left cavities were moderately firmly contracted, and contained a small amount of fluid blood. The muscular structure was not so red as normal, and there was one part of the anterior wall of the left ventricle about one inch long and involving fully the inner half of the thickness of the wall, which presented a distinctly grayish, fibrous appearance. The endocardium was nowhere noticeably thickened, and all the valves were apparently competent, the only abnormal appearances noticed being a few atheromatous patches on the aortic leaflets. On microscopic examination the muscular fibres were found to have undergone positive, though not advanced, granular degeneration; and at the fibroid patch above described there was a marked excess of fibrous tissue present.

The other portions of muscle examined all showed a slight degree of granular change, with in places an abnormal amount of fibrous tissue; the muscular fibrillæ also showed a marked tendency to break up into longitudinal dotted filaments. The increase in fibrous tissue appeared to result from a thickening of the sarcolemma and encroachment on the sarcous material.

Vascular system: The aorta presented a good deal of atheromatous disease throughout the arch, but this became intensely marked in its descending and especially in its abdominal portion. Here it formed a widely patulous, rigid tube of unusually large calibre. On section, its walls were found much thickened, varying from one-tenth of an inch in descending thoracic to one-fifth of an inch in abdominal portion. This thickening affected all the coats, the external being very dense and thick, the middle in places measuring one-sixteenth of an inch in thickness and presenting very numerous and large atheromatous patches. Some of these were soft and almost diffluent, others of fibroid consistency, while in many calcareous formations had occurred. The internal coat was in places puckered or in folds, and in others presented irregular yellowish-white elevations at the seats of the atheromatous deposits. It was much thickened and brittle, and could be easily stripped off in quite long shreds by the forceps. This atheromatous condition was traced in a quite marked degree throughout the primitive and external carotids, but did not seem to have at all reduced their calibre. It had, however, led to constriction of the origin of some of the vessels arising from the abdominal aorta, that of the inferior mesenteric artery in particular being extremely narrowed, while just beyond this the vessel presented an almost aneurismal dilatation. The walls of the right renal artery were also very much thickened at the origin of this vessel. The arteries of the extremities could not be examined with the exception of the right radial and ulnar. The lining membrane of the heart and large arteries was deeply stained red.

The ulnar artery was of fair size, the surrounding connective tissue too dense, but not so much so as to compress the vessel much. There was no noticeable change in its walls, the lining membrane merely appearing a little wrinkled. As will be hereafter detailed, the skin on the ulnar side of the carpus was comparatively little affected.

The radial artery was, on the other hand, so much compressed by the dense fibrous tissue in which it was imbedded that its calibre did not exceed one-thirtieth of an inch. The walls themselves were slightly rigid, and on examining the lining membrane it was found to be distinctly rugous and thickened, corresponding to Rokitansky's hypertrophy of the lining membrane of vessels. No atheromatous spots were seen in the small section removed.

The circulation through the part examined must certainly have been very much interfered with, and, in all probability, as the induration was increased for a short distance below the point from which the skin was removed, its calibre was almost obstructed further down.

Thorax—Lungs: On the right side lung closely adherent by strong, old bands, some of which were œdematous. The lung itself was somewhat œdematous, but presented no organic disease of its texture.

The left pleural sac contained about one quart of turbid serum, discolored with blood; the lung was carnified and non-crepitant from pressure. Both layers of pleura, but especially the parietal, were slightly roughened, thickened, and of a slate-color, with scattered ecchymotic points. There were a few small sub-pleural fatty tumors projecting into this pleural sac.

Abdomen: The peritoneal cavity contained a very small amount of serum. The peritoneum was everywhere smooth and glistening, but its parietal layer appeared more whitish and opaque than usual; and, on removal, portions of it seemed somewhat thickened. There were no false adhesions.

The *omentum* was much shrivelled and contained very little fat.

The *stomach* was contracted and felt unusually firm. On opening it about four ounces of grumous semi-fluid matter escaped, which did not appear to contain much blood. The walls were apparently slightly thickened, especially the subserous and muscular coats.

The mucous membrane over the pyloric half of the organ was slate or chocolate-colored, with numerous ecchymotic points; the rugæ not hypertrophied, but at least six very small, shallow ulcers, with irregular walls and dark, bloody bases, were found on the summit of these folds. No obstruction of pyloric orifice.

The greater part of the *small intestine* was contracted and apparently healthy, though not opened; the duodenum, however, was distended with a grumous, chocolate-colored fluid. Its walls were not materially thickened.

The *pancreas* was rather large, and unusually hard.

The *liver* was enlarged, and especially in its left lobe, which extended across the epigastrium and reached two and one-half inches below the xyphoid cartilage. The entire organ was very heavy, and had a very unusual hardness and elastic resistance. Its capsule was smooth and slightly thickened, and the surface faintly granular, as seen through the capsule. On section, the organ was found gorged with dark fluid blood, which poured freely from it, leaving a moderate degree of nutmeg-congestion. The section was slightly granular, and very hard; the color had in parts a yellowish tinge.

On microscopic examination the cells were found to contain an excess of oil globules, and there was also too much free fat; but the outlines and nuclei of the cells were in nearly every instance well preserved. There was moreover marked increase of fibrous tissue and fibre cells.

The *gall-bladder* contained a small amount of bile without any calculi.

Spleen scarcely enlarged, but its capsule uniformly thickened to a slight degree with a few patches of very marked thickening. Its tissue was unusually firm and resisting, and on section the surface was closely studded with thin white fibrous trabeculæ. The pulp appeared normal, and on microscopic examination presented the usual elements, with a marked increase in the bands of fibrous tissue traversing it. The walls of the minute arterioles in its substance also seemed thickened, so that the vessels were unusually patulous and distinct; this, however, is not to be regarded as a positive observation.

Supra-renal capsules were of normal size and external appearance. On section, the central cavity usually found after middle life, was quite large, especially on right side, and contained a layer of ochre-yellow substance on its walls which proved to be purely fatty.

Kidneys were of about normal size, but unusually heavy, dense, and hard. The capsule was rather too adherent; the surface of the organs was not granular. On section, marked congestion was found, especially of straight vessels. The cortex not diminished, but very hard, coarse-grained, and of a mottled yellowish-red color.

On microscopic examination, the epithelium was found in parts highly granular. The Malpighian bodies seemed quite large and clear. The intertubular connective tissue was unquestionably increased in a quite marked degree. No cysts were found.

Blood: As already said, the blood in the right cavities of the heart was frothy from decomposition; it was, however, fluid and dark throughout the body, and but a very few small, soft, dark clots were obtained from some of the larger veins. No coagulation occurred even after twenty-four hours standing. On microscopic examination no attempt at formation of rouleaux was observed. The red corpuscles lay singly over the field, and had lost much of their hæmatin to the surrounding serum which was deeply tinged. Many of them were crenated, others very small but smooth and round, while still others were much swollen and had lost their biconcave form.

The white corpuscles were not increased in number, but in several instances at least seemed distended from osmosis. Their nuclei appeared normal.

As before stated the lining membrane of the heart and larger arteries and veins was deeply stained by the altered and exuded hæmatin. No careful examination of the veins was made, but it is believed that no marked lesion was present.

Skin and subcutaneous tissue: The appearances after death were identical with those described during life. There was the same peculiar hide-bound appearance with marked prominence of bony points. The brownish patches remained as marked as ever.

On the neck the skin was moderately thickened and indurated, but no preternatural adhesions were seen to account for the marked tightness which was noticed in this part during life.

The skin over the sternum presented a marked waxy appearance, was immovable, and on making efforts to cut it had all the toughness and hardness of sole leather. There was scarcely any subcutaneous fat visible, and the adhesions of the skin to the sternum and clavicle were so marked that over these latter bones it required dissection with a scalpel to separate it. On section the skin and subcutaneous tissue appeared as a dense layer about one-sixth of an inch thick. On closer examination the cuticle and derm did not form more than one-half of this layer, the under half being formed of the condensed and hypertrophied connective tissue. The section of this showed in places a rather fine network formed by bands of dense fibrous tissue, in the meshes of which small patches of fatty tissue could be detected; in other places the fat was entirely absent, and the tissue composed entirely of dense fibrous bands, closely apposed. In drying the skin here formed a horny layer one-fifteenth to one tenth of an inch thick. On microscopic examination the cells of the cuticle presented ordinary appearances, forming a rather thin layer. The deeper part of the section presented a dense fibrous structure, with here and there in the subcutaneous portion little patches of fat globules. The white fibrous tissue was so exceedingly close and dense as to render it very difficult to distinguish the vessels or nerves. There was also a considerable amount of elastic tissue in large branching fibres. The hair bulbs in this part were few in number, but appeared to be healthy; one or two tortuous sweat ducts were also seen, obscured by the dense surrounding fibrous tissue.

Sections made after drying the skin were soaked in solutions of chromic acid and glycerin after Beale's method and in solution of chloride of gold.

The skin of the abdomen was somewhat softer; the difference consisting chiefly in the state of the subcutaneous tissue. The cuticle and derm here formed a layer about one-twelfth of an inch thick as over the sternum, but seemed of rather less dense consistence. In the subcutaneous tissue the increase in fibrous tissue though marked was very much less than in other places. It formed firm white bands, some of which ran parallel to the surface, while others ran vertically from the under surface of the derm, thus dividing up the subcutaneous fat into rather small patches. This was, however, succeeded by a very dense fibrous layer, one-sixteenth of an inch thick, immediately in contact with and quite closely adherent to the abdominal muscles.

The yellowish-brown spots described as being present over the abdomen seemed to depend in every case upon a deposit of pigment around the base of a hair.

The skin on the palmar surface of the right carpus presented even more marked changes.

Over the ulnar half the skin was uniformly colored of a brownish hue; it was very dense and hard, the thickness of cuticle, derm, and subcutaneous tissue being about one-seventh of an inch. The subcutaneous fat, which was present in small patches a little higher up, disappeared at the carpus. The adhesions between the under surface of derm and subjacent tissues were somewhat too dense. The ulnar artery would not seem to have been much compressed, save by the tension of the skin.

On the radial side, however, the condition was much further advanced. The skin was of a dead, waxy whiteness, with a few small brown spots. The derm and subcutaneous tissue formed a very dense, pure glistening fibrous layer of great toughness and hardness. In addition to this the connective tissue surrounding the subjacent vessel, nerve, and tendons was so thickened as to imbed them in a dense fibrous mass. The movements of the flexor longus pollicis were thus much impaired and the radial artery greatly compressed, as before described. In the central part of the carpus the tendons were more free, although their sheaths were thickened and there was some adipose tissue beneath them.

In both the cases above narrated there is especially to be noted, aside from other points of interest, the intense and apparently causeless irritability of the stomach. In the case of the female the administration of arsenic could not possibly have been held accountable for her vomiting and epigastric distress, which was out of proportion to the amount of the drug ingested and persisted long after all traces of the arsenic must have been eliminated from the system. In the case of M. M. the arsenic could in no way be suspected of exciting the gastric symptoms. On the other hand, arsenic in the latter case produced rapid and intense œdema, although but a small quantity of the drug had been administered. This peculiar susceptibility to the action of arsenic in both of these cases is noteworthy, although in the case of B. H. it merely served to light up an irritable condition in a formerly fairly quiescent organ.

In the case of B. H. the effect of coming storms upon the severity of her symptoms deserves attention. There was nothing in her history to denote a rheumatic origin of her trouble, so that to this influence cannot be attributed with certainty any causative influence in the absence of other substantiating symptoms.

The occurrence of herpes zoster in the case of M. M. can only be explained by alterations in the intercostal nerves of much the same character as was actually found to be present in other spinal nerves examined after death. It is unfortunate that the nervous supply of the affected area was not examined microscopically. The *post-mortem* appearances in both cases have a general resemblance, chiefly as regards the condition of the skin and subcutaneous tissue, but also very noticeably in regard to the marked thickening of the splenic capsule. This, in all probability, was merely a part of the apparently universal tendency to connective-tissue overgrowth so markedly seen in other situations.

Probably the tubercular process found to be present in Case I. was simply grafted upon the affection of the fibrous tissue. The patient's general condition was so much impaired by prolonged digestive disturbance and inability to lead an active life that it is easy to imagine her a ready subject for the onset of tubercular processes, without necessarily attempting to assign any special etiological significance to either disease. In her case it is difficult to trace her trouble to any cause, but in Case II. there was the definite and distinct history of exposure where the parts first involved were put into the poorest condition for receiving a proper supply of blood during an intensely cold night. It can scarcely be doubted that this exposure to extreme cold, acting locally, was the cause of the onset, at least, of the sclerotic process.

The case of M. M. bears a striking resemblance in some respects to Reynaud's disease, although its later course showed no analogy to it.

BONE AND JOINT DISEASE, A SEQUEL OF CERTAIN SPECIFIC FEVERS, ESPECIALLY SMALLPOX.

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It has long been known that periostitis is an occasional sequel of enteric fever. Attention has been drawn to this fact by several writers. Murchison[1] has recorded cases in which the femur, tibia, and temporal bone were affected—the last two becoming necrosed. In 1876 Sir James Paget[2] published some observations in which he pointed out that these sequels appear when the patient is *well of his fever* and in a condition of advanced convalescence. The tibia appeared to be the favorite seat of election. In several cases the ribs were affected. Occasionally the femur, fibula, ulna, radius, scapula, or parietal bones had been involved. Sir James Paget had not, however, met with periostitis and necrosis after any other than typhoid fever. Of three cases recorded by Affleck,[3] the humerus was involved in two and the tibia in one. And in each instance the periostitis occurred *during the course of the fever*. Keen,[4] who collected sixty-nine cases in which continued fevers were complicated by bone disease, regards osseous lesions as infrequent although important consequences of typhoid fever. Hayward[5] met with several cases. In one suppuration did not occur; in a second, several long bones were attacked and suppuration followed; in a third, first the left tibia was affected and subsequently the right tibia in two places. Jackson[6] has published a case in which periostitis of the left third rib commenced two months after subsidence of the fever, and after suppurating did not finally heal for seven months. According to Bourgeois[7] the tibia, femur, humerus, ulna, and maxilla are attacked in that order of frequency, sometimes more than one bone being affected and the left side being more often attacked than the right.[1]

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[1] Continued Fevers of Great Britain, 1873, p. 582.

[2] St. Barth. Hosp. Rep., xii. "On Some of the Sequels of Typhoid Fever: Phlebitis, Periostitis With or Without Necrosis, especially Periostitis of Ribs," etc.

[3] Quoted by Macnamara: Diseases of Bones and Joints, 1887, p. 79.

[4] Surgical Complications, etc., of Continued Fevers, Phila., 1887. Quoted by Jones: Diseases of the Bones, 1887, p. 41.

[5] British Medical Journal, vol. i., 1885, p. 16.

[6] Ibid., vol. i., 1885, p. 428.

[7] Sajous, vol. ii., 1888, p. 287.

I have only seen one case. In this, a lad of fifteen, periostitis of the tibia occurred during the height of the fever.

Scarlatina, measles, and even chickenpox[2] are occasionally followed by bone or joint disease. In many cases, no doubt, they act as a predisposing cause by producing great deterioration of the general health. In others there seems good reason for supposing that the exanthematous poison may have a direct and local action. In the jaw, for instance, there is a form of alveolar necrosis accompanied by shedding of teeth which appears to be the result of the local application of a specific (fever) poison to the vascular parts of the teeth.[3] Scarlatina is a potent cause; but both measles and typhoid may present similar sequelæ. Cases have been recorded by Jackson,[4] Hillier,[5] Smith,[6] Poland,[7] Franklin, and Lawton.[8] But a larger number occur which do not find their way into print.

Variola.—The literature with regard to smallpox is still more scanty. I believe that it is not generally known that after variola, too, there is a liability to bone and joint affections. Fox,[9] in 1806, recorded two cases in which alveolar necrosis occurred after variola. Ancell[10] reported a case of epiphysitis in an infant eleven months old suffering with variola. In 1873 Golgi[11] showed that the medulla of bone is always altered in smallpox, being unusually soft and often congested. Especially is this the case in the hæmorrhagic form in which the condition of the medulla, with extravasations in its spaces, is absolutely diagnostic. McLeod[12] has described four cases of joint disease. In one, a girl aged nine years suffered two months after an attack of smallpox from symmetrical abscesses about the shoulders and elbows. Both elbow-joints were ankylosed, and a portion of the right acromion process was necrosed. In a second case, suppurative epiphysitis of the bones in both elbow-joints occurred, all the epiphyses becoming detached. In another patient abscesses formed in both legs, resulting in "stiffly flexed" knee-joints; and portions of necrosed bone were removed from the left fibula and right radius. In a fourth case necrosis of the right tibia, both fibulæ, and the left humerus occurred, and resection of the left elbow-joint was performed. Three cases have also been reported by Joubert.[1] One was a girl aged fifteen; both elbows were ankylosed in the straight position, and showed traces of former sinuses. There was also necrosis of both radii, from which long sequestra were removed. The right elbow was excised with good success. Then, in a boy aged ten years the left shoulder and both elbows were ankylosed in a nearly straight position. There were traces of former sinuses. Both elbows were excised with good results. The third case was a girl aged fourteen years, whose right elbow was ankylosed at an obtuse angle. This was also treated by resection. In a discussion on these cases, Ahmed[2] stated that he had frequently met with abscesses and ankyloses of joints following smallpox, and that elbow-joints were most liable to disease. Four other cases were published by Arthur Neve:[3] (1) Disease of both elbows and one wrist-joint; simultaneous excisions; cure. (2) Complete necrosis of ulna; resection; cure. (3) Necrosis of left scapula; resection; cure. (4) Acute suppuration of shoulder-joint; incision and drainage; cure. Finally, two cases have been reported by Mitra[4] in which the elbow and the hip respectively were affected and were treated successfully by incision and drainage.

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[1] For further references see: Mollière (Sajous), La Semaine Méd., 1887; Martha (Sajous, E. 24, vol. iii., 1889). Mercier, Revue mensuelle de Méd. et Chir., No. 2, 1879, p. 21. Levesque, "De la Périostite dans la Convalescence de la Fièvre Typhoide," Thèse de Paris, 1879. Routier (quoted by Hayward), Le Progrès Medical, 1879.

[2] Townsend: "Acute Arthritis of Infants.," Internat. Journal Medical Sciences, vol. v. Holmes: Surgical Treatment of Children's Diseases, London, 1869.

[3] S. J. A. Salter: Holmes's System of Surgery, vol. iv. p. 384, 2d ed. Guy's Hospital Reports, 3d series, vol. iv.

[4] Medical Times and Gazette, vol. ii., 1862, p. 681.

[5] Lancet, vol. ii., 1862, p. 247.

[6] Ibid., vol. ii., 1878, p. 806.

[7] Medical Times and Gazette, vol. i., 1869, p. 383.

[8] Lancet, vol. i., 1879, pp. 553–685.

[9] Treatment of Diseases of the Teeth, London, 1806, p. 112.

[10] Archives of Medicine, 1830, vol iv. p. 491 (quoted by Townsend, loc. cit.).

[11] Jaccoud: Pathologie Interne, 5th ed., vol. ii. p. 705.

[12] Indian Medical Gazette, vol. xv. p. 94, vol. xvii. p. 114

I have been unable to find records of any other cases, although I do not doubt that in all epidemics of variola there must be a tendency for these sequelæ to occur.

In Kashmir, which is an unvaccinated State, with but few exceptions every inhabitant suffers from smallpox, usually in childhood. The infantile mortality is appalling. Of the survivors a large number suffer sequelæ, amongst which bone and joint diseases occupy a place of some importance.

I have now to add, to those cited above, twenty new cases, most of which occurred during the winter 1889–90, when there was an epidemic of unusual severity. All were either under my own care or that of Mr. Arthur Neve.

For the sake of brevity only the salient features will be noted.

CASE I. *Alveolar necrosis.*—Child, aged four years. November, 1889. Sequestrum measures one and a quarter inches by one and a quarter inches, and contains two empty sockets and one unshed incisor tooth.

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[1] Indian Medical Gazette, vol. xviii. p. 230.
[2] Ibid.
[3] Lancet, vol. ii., 1887, p. 609.
[4] Indian Medical Gazette, March, 1890.

Case II. *Alveolar necrosis.*—Nabira, male, aged five years. June, 1890. Sequestrum one and a half inches by three-quarters of an inch, containing two molar teeth.

Case III. *Necrosis of right clavicle.*—Male, aged four years. December, 1887. Sinus over junction of osseous shaft with cartilage of epiphysis. A necrosed portion one inch long removed from junction of shaft with epiphysis. New bone around. Rapid recovery.

Case IV. *Necrosis of clavicle.*—Ashi, female, aged six years. April, 1885. Separation and necrosis of sternal end at epiphyseal line. Small fragment removed. (Left femur and fourth rib on the right side also affected.)

Case V. *Necrosis of spine of left scapula.*—Jamad Shah, male, aged nine months. January, 1890. Abscess at back of shoulder containing half an ounce of pus. Sequestrum at junction with acromial epiphysis, size of haricot bean with a thin prolongation for an inch along the scapular spine. Healed rapidly.

Case VI. *Necrosis of spine of left scapula and disease of left elbow-joint.*—Azizi, female, aged seven months. February, 1890. Smallpox a month ago. A smooth surface of separation from the epiphysis at the acromial end of the spine. Sequestrum the size of an almond, with a long, sharp tail corresponding to the free edge of the spine. Left elbow has also been affected but is now almost healed. Joint fairly movable. A small sinus leads into it.

Case VII. *Elbow and scapula.*—Fazli, female, aged three years. February, 1890. Right elbow-joint swollen and fluctuating. Articular ends of humerus and ulna enlarged and tender. On opening joint the trochlear surface of humerus found to be diseased. Ulceration of cartilage. Floor of carious bone. No sequestrum or ulceration of head of ulna. Arthrectomy. Recovery with movable joint. Sinus over spine of left scapula near acromion process, no sequestrum.

Case VIII. *Elbow.*—Male, aged one year. October, 1889. Articular surfaces of right humerus and ulna ulcerated. Extensive necrosis of cartilage has occurred. Synovial membrane greatly thickened. Sinuses. Partial resection. Recovery in three weeks with movable joint.

Case IX. *Elbow.*—Habiba, male, aged one a half years. November, 1889. Sinus leading into joint. Articular surfaces of left humerus and ulnar found ulcerated. No sequestrum. Carious end of ulna snipped off with bone forceps leaving cartilaginous olecranon process. Rest of joint including thickened synovial membrane removed by scraping and gouging. Delayed but satisfactory recovery with limited mobility of joint.

Case X. *Elbow.*—Ahadou, male, aged two years. December, 1889. About a month since smallpox. Abscess of left elbow-joint with sinus at radial side posteriorly. Synovial membrane thickened and granulating. Outer aspect of articular surface of humerus and external condyle eroded with bare carious bone forming the floor of the ulcer. No sequestrum. Gouged and scraped. Rapid recovery.

Case XI. *Elbow.*—Doulti, female, aged one year. December, 1889. Swelling of left elbow. Fluctuation. No sinus. Skin unbroken. Joint opened by posterior incision and bare bone on trochlear surface of humerus gouged. Ulcerated articular cartilage of ulna scraped. Small sequestrum from ulna, size of haricot bean. Synovial membrane erased. Rapid recovery.

CASE XII. *Both elbows.*—A female infant. February, 1890. On the left side suppurative arthritis with a sinus. The head of the radius was diseased and a small sequestrum removed. On the right side the articular surface of the ulna was ulcerated. The joints were scraped and the diseased bone gouged. Recovery took place with fair movement.

CASE XIII. *Both elbows and multiple abscesses.*—Sandhu, male, aged one and a half years. December 20, 1889. Both elbows greatly enlarged and the swelling extends up to the arms above the joints for two or three inches under the triceps. Skin unbroken. On incising under Listerian precautions, the pus was found to be thick. Synovial membrane not greatly thickened but injected, soft, and granulating. On both sides there was ulceration of the articular surface of the humerus and of the ulna. The joint cavity was thoroughly scraped with Volkmann's spoon. After a few days the use of the spray was discontinued. About December 27th an abscess appeared over the external epiphysis of the clavicle. This was incised and healed at once. About the same time a collection of pus was discovered in each leg, on the right side at the upper end of the shaft of the tibia and on the left side at the lower third. These also were opened and healed promptly. A similar localized suppuration occurred over the acromial epiphysis on the left side. This also subsided after incision without necrosis.

January 18, 1890. Left arm healed, movement free. A suppurating sinus leads into the right elbow-joint.

30*th.* Abscess has formed on right side of neck, not connected with bone and not glandular. A small sequestrum removed from the right elbow-joint. This was a portion of the head of the ulna. The wound then healed.

February 26. The left elbow has again begun to discharge. An arthrectomy was now performed, and a loose cartilaginous sequestrum was removed from the external condyle. There was ulceration of the articular cartilage of the ulna, the tip of which at the epiphyseal line was carious. This was followed by rapid recovery.

CASE XIV. *Elbow and necrosis of ulna.*—Female infant. January, 1890.—Anterior and outer articular surface of olecranon bare, and carious joint very little swollen. Sequestrum one and a half inches long from middle third of ulna. Joint cavity scraped. Speedy recovery.

CASE XV. *Disease of right elbow and left ulna.*—Rami, female, aged one year. February 11, 1890.—Had smallpox a month ago. Discharging sinus from right elbow. On opening the joint, articular surfaces of ulna and humerus deeply eroded. Cartilaginous tip of olecranon separated from the shaft. The cartilaginous surfaces of the bones were excised and the synovial membrane erased. The head of the left ulna was projecting under the skin near a sinus in the upper third of the forearm. The whole bone (except the styloid end) was withdrawn as a long sequestrum. The elbow-joint was unaffected, being separated from the necrosed shaft by the cartilaginous epiphyseal tissue of the olecranon. The dead bone showed no signs of osteitis or other morbid change, except partial disintegration just below the lesser sigmoid cavity. Its death had evidently been rapid and complete.

Rami was dismissed on March 14, 1890. The left ulna was being rapidly re-formed. The child was weakly, but it was hoped that she would pick up strength. There was free movement of the left elbow, and fair on the right side.

CASE XVI. *Disease of left ulna and left knee-joint.*—Kougi, female, aged two years. February 3, 1890.—A sequestrum of the ulna exactly similar in every respect to Case XV. Healing was equally rapid. In the knee-joint both the femur and tibia were profoundly diseased. Beneath the external condyloid cartilage at the epiphyseal line there was an area of softened diseased bone the size of an almond. From this a sinus passed through the ulcerated cartilage to the joint. In the head of the tibia was an abscess cavity containing the epiphyseal nucleus as a loose sequestrum. This cavity communicated above with the joint, and anteriorly there was a sinus communicating with the open air. Thus there was suppurative arthritis with double epiphyseal abscesses, the tibia being the more severely affected. Arthrectomy was performed and gouging. When the child left (March 14, 1890) there was still some discharge from the sinus. One knee had consolidated much, but the limb was distinctly flail-like.

CASE XVII. *Necrosis of Ulna.*—Zuni, female, aged ten months. June, 1890.—Had smallpox three months ago. Now a deep scar two inches long immediately below olecranon, and at middle third of left ulnar border of forearm a sinus communicating with dead bone. From this I withdrew a cylindrical sequestrum two inches long, evidently the remains of a completely necrosed ulna. The wound healed in a few days.

CASE XVIII. *Disease of the knee-joint.*—Ramzana, male, aged two years. March 31, 1890.—Had smallpox two months ago. Knee swollen and evident synovial thickening, with enlargement of articular ends of femur and tibia. Pus thick. Head of tibia deeply eroded and necrosis of the epiphyseal nucleus. This was removed and the synovial membrane erased. The patient was discharged on May 12, 1890, quite well. The knee was not stiff.

CASE XIX. *Sub-periosteal abscess of femur.*—A boy, aged three years. February, 1890.—Knee painful for twenty days. Deep, indistinct fluctuation behind and above knee. On incising to the bone above the condyle on the outer side, a small collection of sero-purulent fluid was tapped. The child recovered without necrosis.

CASE XX. *Necrosis of humerus (epiphyseal).*—Lassoo, male, aged seven years. May 31, 1890. Had smallpox one and a half months ago. Great œdema of upper extremity. Two sinuses, one at the upper the other at the lower end of the humerus, each leading to dead bone. Sequestra were removed from each of these positions. The upper was about two inches long, and evidently connected with the epiphysis. The head of the humerus appeared absorbed. The lower sequestrum was apparently also juxta-epiphysary. The shaft of the bone was much thickened, and there was some stiffness of the elbow-joint. The discharge rapidly subsided. The boy was dismissed June 28th. It is possible that a further sequestrum may separate from the shaft of the bone at some future time.

ETIOLOGY.—It is not surprising that organs occupying such a large area, and discharging functions so important as the bones and joints, should occasionally suffer after certain specific fevers. The intimate nervous and vascular relationship of the joints to the skin by which they are covered, the affinities of endothelium and epithelium, the important vascular supply of bones, especially of the medulla and articular ends, the blood-forming properties of the marrow, and in the case of the teeth and alveolar processes, the dermal origin and extraordinarily active developmental changes, all tend to mark out the joints and bones for participation in the morbid processes set up by specific fever poison.

In most of the continued fevers, abscesses of soft tissues may occur as sequelæ. In typhoid we know that there is, in addition to more obvious changes, a scattered minute lesion to be found oftentimes in the mesenteric glands, spleen, and liver. This, which is of the nature of a localized cloudy swelling, is probably infective, although I believe that hitherto the typhoid microörganism has not been demonstrated in it. In most cases resolution occurs. But it is not difficult to see how predisposition of the patient and intensity of the poison might favor suppuration. Now, in enteric fever, which is a disease *totius substantiæ,* it is probable that the abscesses which form (whether periosteal or not) have an origin of this nature.

But while the same tendency exists in other infectious febrile diseases, nowhere is it more marked than in smallpox. In the confluent variety especially, the formation of boils and abscesses is common. And in a suppurative disease like variola it might be anticipated that symptoms of a pyæmic nature would sometimes occur. The poison is absorbed by the lymphatics and passes on into the small veins, from which it is scattered far and wide. It is by no means improbable that multiple abscesses in smallpox may thus have an embolic origin. To some of the cases recorded above this affords a ready solution. But although the mechanism of production may be similar to that of pyæmia, the poison is, I take it, distinct. The abscesses are free from putrefactive odor and run an aseptic course under strict Listerism. It is an interesting point as to whether the pus from such a joint is capable of reproducing smallpox if inoculated. For it is a post-variolous condition, and the joint affection does not coincide with the skin eruption.

What determines the sites of manifestation? Why is the upper extremity so frequently affected? For as far as epiphyseal nuclei are concerned the development of the upper extremity is much later than that of the lower, and, therefore, it might be regarded as less prone to disease. But on the other hand, I think that a young infant uses its arms more than its legs, and so the former are more liable to injury. Again, in Eastern countries where the lower half of an infant's body is warmly reposing within its mother's dress, the arms are certainly more exposed to cold. Moreover, there is often a greater development of pustules on the upper half of the body, and this might influence, through the lymphatics, the site of a suppurative lesion.

The seat of election in the bones is either at the epiphyseal line or else under the periosteum. In cases of complete necrosis, as, for instance, those of the ulna, both sides may be attacked, and it is difficult to ascertain which is the primary lesion.

The selection of these points for attack is due partly to their developmental activity and consequent vascularity. In the case of the epiphyses the junction of the rigid shaft with the more yielding cartilage offers a condition favorable to mechanical strain and injury. Any other predisposing cause (whether hereditary, as syphilis, or not), would have due weight,[1] in favoring bone disease.

Pathology.—The thirty-six cases of bone and joint disease after variola cited above can be grouped into divisions. Thus, there were four cases of alveolar necrosis. Twenty-one patients suffered from bone disease with necrosis. Twenty-six suffered from joint disease. In twelve cases one or more epiphyses were affected.

Disease was more frequent in the upper extremity. Eighteen patients suffered from disease of the elbow-joint. In several of these the lesion was bilateral, so that there were twenty-five elbow-joints affected. In six instances there was disease of the acromion. The other figures stand as follows: Necrosis of ulna five, clavicle three, radius three, humerus two, disease of shoulder-joint two, wrist one. This gives a total of twenty-eight joint lesions in the upper extremity and fourteen bone affections. While in the lower extremity only five joints were diseased and nine bones, viz.: knee-joint four, hip-joint one, tibia four, fibula three, femur two.

Alveolar necrosis is probably less common after smallpox than after some other eruptive fevers. The affections peculiar to variola may be considered conveniently under the headings: (1) Joint disease, (2) epiphyseal disease, (3) bone disease.

1. *Joint disease.* I have already shown how frequently the elbow is affected. In seven cases the disease was bilateral. In the rest it appeared to occur with about equal frequency on the right and left sides. The condition is essentially subacute. The articular ends of both humerus and ulna are apt to become enlarged. The muscles are not distinctly wasted. In several cases the ligaments are much relaxed. The synovial membrane is thickened and presents a velvety appearance. Ulceration of the articular cartilages is invariably present. The ulna and humerus appear to be affected with equal frequency. In the former the upper bony tip of the olecranon end of the shaft often forms the floor of the ulcer, and there is a distinct tendency to the casting-off of a small scaly sequestrum. In the humerus the trochlear surface is usually eroded. In several cases this has proceeded so far as to destroy all form and to leave the lower end of the bone as a convex, ulcerated surface with patches of carious bone in the floor. In other cases there is detachment of one or more epiphyses. It is rare for the radius to be

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[1] "Etiology of Bone Disease," by E. J. Neve. Indian Medical Journal, 1888-89.

affected. When sinuses exist they are usually found close to the upper end of the olecranon process on the outer or inner side.

It appears probable that there are here two types of elbow disease. One is a *primary arthritis*—the joint becoming affected as a whole. For in several of the above cases the different structures of the articulation appear to be involved in a common disease. In fact, it may be said that where the epiphyses are not obviously affected we have probably to deal with a general arthritis. And even sometimes when the epiphyses are detached late in the course of the disease it is only a part of the general process of disintegration. Where *primary epiphysitis* has occurred the disease can be localized to the epiphyseal line or else is found to be more severe at that position.

2. *Epiphyseal disease.* If arthritis of the elbow is the typical joint sequela of smallpox, there are some forms of epiphysitis which are hardly less characteristic. Such, for example, are the instances of disease of the acromial and clavicular epiphyseal lines in which the focalization of the lesion is most precise. But in the long bones also the same tendency is observed. Thus, in one case both ends of the humerus were attacked. In the examples of entire necrosis of the ulna it will be observed that in four cases the elbow-joint was unaffected, although separation had taken place at the epiphyseal line above the olecranon process of the shaft.

In the knee-joint, however, the tendency for an epiphysitis to involve the articular cavity is great. I have noticed this before in other cases than smallpox. But it is well illustrated by cases XVI. and XVIII.

3. *Bone disease.* Apart from caries and small sequestra occurring in the diseased joints, bone disease occurs chiefly in three forms after variola, viz.: Complete necrosis, partial necrosis, and subperiosteal abscess. There were four cases of *complete necrosis* of the ulna. In all of these the bone was unchanged, except in so far as disintegration had set in. There was no evidence of osteitis.

The death must be regarded as due to subperiosteal suppuration. In such cases it appears that separation at the epiphysis may have been either primary or secondary. If the former, the periosteal suppuration may have arisen at the epiphysis. If the latter, then the suppurative periostitis was the primary disease, the epiphysis becoming involved subsequently. We can understand that in such a case as that of Sandhu (XIII.) the subperiosteal abscesses might in the absence of treatment have produced death of the tibial shaft. In one case there was almost complete necrosis of both radii. *Partial necrosis* occurred twice in the left fibula and once in the right fibula, right tibia, and right radius, left ulna, left humerus, and left scapula. *Subperiosteal abscess* without necrosis occurred twice in the femur, twice in the tibia, and also on the fourth rib.

DIAGNOSIS.—The history and period of onset of these diseases is characteristic. A bone or joint lesion occurring in an infant or young child three or four weeks after smallpox and running a subacute course with suppuration, leaves little doubt as to its nature. The patients are usually profoundly pock-marked with recent scars. Cases seen for the first time as late as two or three months after smallpox show from the advanced state of their lesions that the condition must have arisen soon after, if not during, convalescence.

TREATMENT.—In many cases the treatment required is extremely simple. Incision and drainage of subperiosteal collections is sufficient. Sequestra become separated with great rapidity (in spite of the otherwise subacute course of these diseases) and can be readily removed. In the joints simple incision and drainage are sometimes productive of good results, but they are more frequently followed by prolonged suppuration and final ankylosis. So the choice really lies between modified excision and arthrectomy. I think that the joint should be freely laid open and the synovial membrane removed as far as possible. The amount of articular cartilage removed must depend upon the extent of the disease. But generally the surgeon should aim at removing sufficient to diminish the risks of ankylosis and yet avoid interference with epiphyseal growth.

Owing to the age of the patients recovery is usually rapid. Indeed, even if left untreated, there is a strong tendency to natural cure, whether by spontaneous extrusion of sequestra or by suppuration and ankylosis of joints.

SUMMARY.—*a*. Periostitis, epiphysitis, necrosis, and arthritis may occur after and on account of exanthematous fevers, especially smallpox.

b. They usually, but not invariably, appear during late convalescence.

c. In *typhoid* fever the most frequent of these sequels is periostitis. And this attacks long bones by preference, especially the tibia, but seldom results in necrosis. Arthritis, if it ever occurs, must be extremely rare.

d. Alveolar necrosis is of not infrequent occurrence. It is a commoner sequel of scarlatina and measles than of the other exanthemata.

e. After smallpox—

(1) Arthritis, the most characteristic lesion, occurs with greatest frequency in the elbow, and less often in the knee, shoulder, hip, and wrist. Sometimes it is primary. Occasionally it is secondary to epiphysitis.

(2) Next in frequency is partial or entire necrosis of long bones, especially the ulna.

(3) Suppurative epiphysitis with or without necrosis is not uncommon. The acromion is frequently attacked, as are also the long bones.

(4) These post-variolous diseases occur chiefly, if not entirely, in

infants and young children, and are often multiple. They are subacute and a fatal termination is rare.

f. The various conditions enumerated above have a tendency to spontaneous recovery by suppuration, extrusion of sequestra, and ankylosis of joints.

g. As treatment, incision and drainage, with removal of sequestra, is usually sufficient. But in cases of arthritis, prolonged suppuration and ankylosis may be avoided by arthrectomy or partial resection of the joint.

MISSION HOSPITAL, KASHMIR, INDIA,
July 4, 1890.

SURGICAL AND MECHANICAL TREATMENT OF THE DEFORMITIES FOLLOWING INFANTILE SPINAL PARALYSIS.[1]

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The pathology of infantile spinal paralysis, or anterior polio-myelitis, is not considered in this article, since the object of the paper is to deal only with the severer grades of resultant deformities.

These deformities are produced by muscular atrophy, degeneration, and contracture, together with want of bone-growth, and the distortions which result from locomotion. The deformities are frequently so great that the individual spends his life upon the floor and the members become so misshapen that they are mechanically unsuited for locomotion even could muscular power be restored. This paper is intended to deal almost exclusively with this class of cases—the ones ordinarily considered hopeless cripples.

Locomotion, however, even in these cases, is often possible by the proper application of surgical means together with the skilful use of mechanical appliances, thereby greatly augmenting the usefulness, the health and the happiness of the individual.

The limbs must first be brought into such position that they will assist in sustaining the weight of the body, or be incorporated as a part of the apparatus to sustain such weight, either with or without crutches.

Surgical measures offer the most rapid and efficient hopes for relief. To attempt to rectify these members by mechanical means alone is to inflict an unwarrantable amount of pain, time, and expense without accomplishing any better results than can be secured by vigorous measures. Section of the tendons and muscles will necessarily be performed upon the strongest group, and they are thus placed at a slight disadvantage, thus tending to restore the equilibrium of the muscular action of the limb.

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[1] Abstract of a paper read at the Tenth International Congress, Berlin, 1890.

Surgical treatment may be classed under the following heads:

I. Tenotomy.
II. Myotomy.
III. Division of the contracted fasciæ and other tissues.
IV. Force.
V. Resection.
VI. Osteotomy.
VII. Amputation.

I.–IV. The first four procedures are frequently combined as one operation. The best rule to be followed is that the shortened tissues must be relieved by section and by force sufficient in amount to permit rectification of the member or to place the limb in a position for locomotion.

At the hip, the deformity being in the direction of flexion, myotomy of the origin of the tensor vaginæ femoris, the sartorius and long head of the rectus, together with the fascia, is frequently necessitated. Rarely the psoas iliacus or the external or internal rotators or the adductors will require division. In this latter case open division is the only safe method. The femoral artery and anterior crural nerve must be carefully avoided. Otherwise section can be freely performed, but whether done subcutaneously or by open incision, thorough antiseptic precautions must be rigidly enforced. Force must be employed to the extent consistent with the integrity of the bone. Extension by weight and pulley must subsequently be applied for many weeks. This continued extension will also greatly benefit the frequently accompanying condition of lordosis.

At the knee, section of the tendons of the biceps or of the semi-membranosus and semi-tendinosus is frequently necessary. If dense bands of contracted fascia remain in the region of the popliteal space open incision will be the wiser procedure.

Horizontal extension by weight and pulley and constant pressure upon the knee by means of splints or weights will add to the subsequent benefits to be obtained by operation.

When great deformity of the condyles is present, as is so frequently the case, resection offers the best hope of restoration. The condition of hyper-extension or of genu-recurvatum or back-knee does not permit of surgical relief except by resection.

Section at the ankle and foot will vary according to the condition of the deformity. In extreme equino-varus, division of the tibialis anticus, posticus, fasciæ and ligaments is frequently required in addition to the tendo Achillis; in fact every contracted tissue which resists rectification must be divided either openly or subcutaneously. The former is the preferable plan, since it heals more rapidly and does not leave a resultant deep sulcus.

When the deformity of the foot is in the direction of valgus, section of the peroneals and forcible rectification of the foot with fixation for a number of weeks in a condition of artificial varus will prove valuable if followed by the use of the proper apparatus.

In calcaneus, shortening of the tendo Achillis is sometimes desirable.

Force to an extreme degree may be required in old cases, and if employed by the surgeon's hands over sand-bags and hard pads need never result in sloughing. Torn ligaments, or even fractures of the bones, if subcutaneously performed, will rapidly heal. Excision of one or more bones will sometimes be required in adult cases.

V. Resection is sometimes desirable at the knee when there is great bone-distortion and the operative procedures already enumerated have been insufficient. Resection is also sometimes desirable in flail limbs in order to secure a stiff walking member; also sometimes in back-knee, in-knee, and out-knee.

At the ankle and foot, tarsectomy is also occasionally necessary in extreme cases. Removal of the astragalus is the simplest and most effective measure. The other bones may sometimes require excision. Powerfully and intelligently applied force with the divisions already described usually takes the place of any form of excision of the tarsus.

VI. and VII. Osteotomy and amputation are procedures which will occasionally become necessary.

Mechanical treatment after operation.—A good position can often be secured by horizontal extension with weight and pulley; by the application of splints or plaster-of-Paris dressings, or by other methods of rectification while the patient remains in bed.

For locomotion some mechanical appliance usually becomes necessary. The principles of these appliances only can here be described. All apparatus should be as light as possible; it should be so arranged that the circulation is free and unmolested, and muscular action should be favored rather than hindered. Every muscle should be compelled to do its full work in the support of the body, since by walking, running, playing, etc. (the most valuable of gymnastic exercises) will the muscle cells be developed. Elastic force should be freely employed, since by such assistance the peroneals, the tibials, the quadriceps, the extensor femoris, or any other muscle, can have its force augmented and yet be itself brought into active use. Pads, straps, stop-joints, rarely locked-joints, etc., are all to be applied as needed.

A flattened valgic arch of the foot should be supported by accurately-fitting steel springs and by elevating the sole of the shoe upon the inner side. The in-knee and out-knee, etc., should be properly supported by pads. An apparatus may be only necessary for the ankle, or the appliance may need to extend almost to the axillæ. In helpless cases, where the entire lower portion of the body is paralyzed, the apparatus must extend to the thorax to support the weight of the body while the body is swung forward upon crutches. In these cases locking and unlocking joints at the hips and at the knee are essential, as the support must be rigid during walking, but flexion is necessary in the sitting posture. The advantages of locomotion in the open air, even with such an extensive apparatus and on crutches, can only be appreciated by one who has been compelled to spend his life upon the floor or upon a bed.

The following are specimen cases selected from my note-books showing the gain that can be accomplished. The illustrations are all taken from photographs.

Case I.—Female, aged twelve years; infantile paralysis in infancy. Has never walked; only slides along the floor. Totally unable to stand, even with the help of a chair. Flexion at the hips and knees. Sub-luxation of both knees. The feet are only slightly deformed, as the weight of the body has never been borne upon them.

Fig. 1.

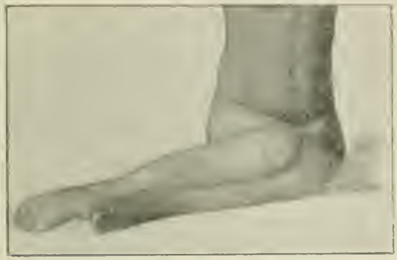


Fig. 2.

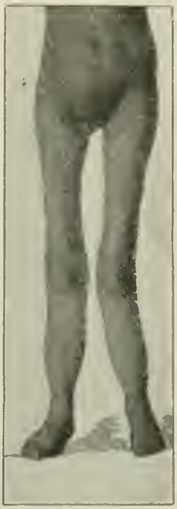
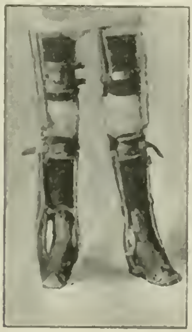


Fig. 3.



Subcutaneous section of the tensor vaginæ femoris, rectus, sartorius, and hamstring tendons, with strong subsequent force, and horizontal extension with weight and pulley. In eight weeks, apparatus extending from the perineum to the feet. Walked first with crutches, then with canes. After one year walked without either, even on rough pavements. Legs developing.

CASE II.—Boy, aged fourteen; infantile paralysis in infancy. At eleven years of age had never walked; dragged himself along the floor. Legs greatly twisted. Flexion at right-angles at the hips and knees. Equino-varus left foot; equino-valgus right foot. Hopeless cripple.

FIG. 4.

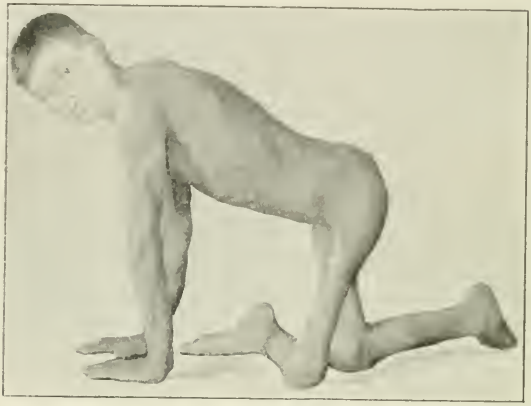
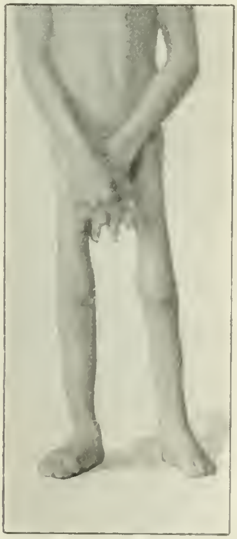


FIG. 5.



Subcutaneous section at the hips, knees, and feet. Fixation by plaster-of-Paris and extension. In two months he walked with crutches with the assistance of an apparatus with elastic straps over the quadriceps femoris, peroneals, and weakened muscles. The valgic foot supported beneath the sole with an arched plate. In six months he was walking long distances, and in one year ran speedily with crutches. Three years later he uses crutches only for long walks, and a cane only for ordinary progression. His limbs are developing and he is capable of earning his own living.

CASE III.—Girl, aged ten; infantile paralysis at three years of age. Absolutely helpless. Discharged from several hospitals condemned to perpetual cripplehood. Limbs perfectly helpless and flail-like. Marked distortion. Extreme lordosis.

Operation; thorough section of all the contracted tissues at hips, knees, and feet; forcible extension and fixation and subsequent pulley extension for nine weeks. Flexion and lordosis greatly improved. An apparatus was manufactured practically constituting the lower half of the body, thus making a support to sustain the weight of the body while it was being thrown forward on crutches. The apparatus extended from the thorax to the feet and rigidly encased the body and limbs, which were a part of the apparatus. There were locking and unlocking joints at the hips and knees.

In one month after, she was able to walk a square upon crutches.

Fig. 6.

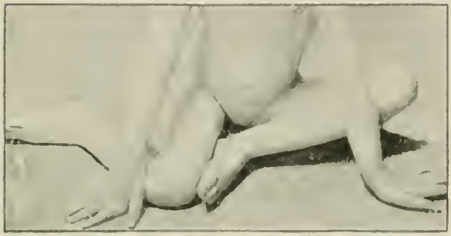
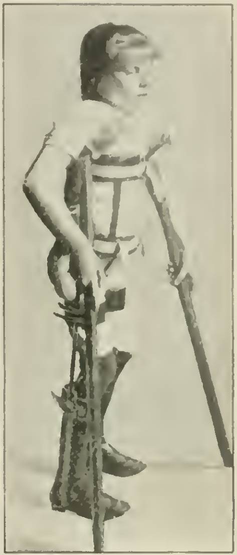
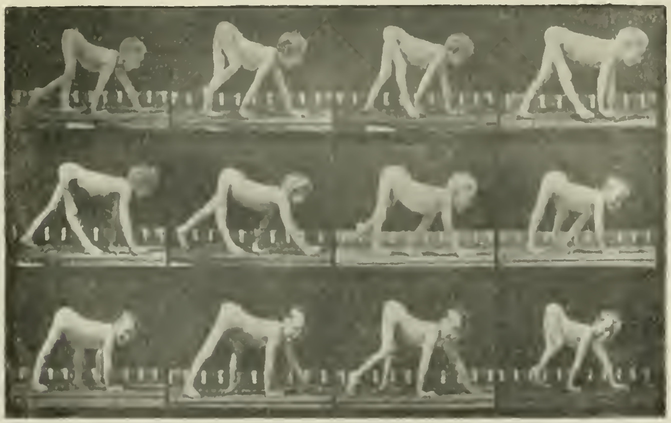


Fig. 7.



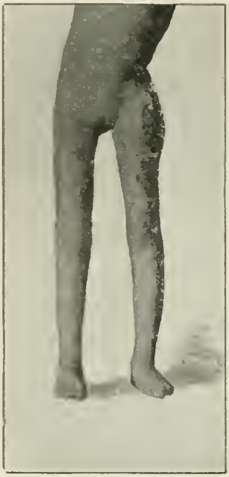
Case IV.—Girl, aged eleven; infantile paralysis from childhood. Totally unable to support the body in an erect position, but could drag herself along the floor. She could walk in the quadrupedal position, as shown in the photograph, with an awkward, difficult gait. The right foot was in a condition of equino-varus and the left that of valgus. There was great distortion of the left hip, not only in the direction of flexion, but also twisting of the femoral neck simulating dislocation. Through the kindness of Dr. J. Hendrie Lloyd, Attending Physician to the Home of the Merciful Saviour for Crippled Children (in which

Fig. 8.



institution I have operated on a number of these cases), I have been able to secure the accompanying photographs illustrative of her locomotion. This series is one of the many admirable advances made by Mr. Edward Muybridge in photographing animals when in motion. By a series of electrical appliances attached to a number of cameras the various stages of progression are secured throughout the action of the limb from the time it is placed upon the floor, through each of the successive acts of raising, carrying forward, and lowering, until the floor is again reached. The advance of locomotion is depicted from left to right.

FIG. 9.



Operation as before, and apparatus applied. Distortion of pelvis and hip irremediable. The limbs are still unable to maintain the weight of the body, but with a little support from the hands she can stand alone. She progresses very comfortably with a cane or with crutches and apparatus.

CASE V.—Girl, aged thirteen; infantile spinal paralysis from infancy. Very helpless. Deformities and operation as before. Apparatus applied. At first used crutches, afterward cane. With apparatus can walk with a fair degree of speed. Slow progression even without apparatus.

CASE VI.—Girl, aged thirteen. Flexion at hips and knees; not so marked as in preceding cases. Extreme valgus of right foot. Still obliged to use one crutch, as the right limb is unable to bear the weight of the body, but could do so if apparatus at hip and knee were made rigid. Without apparatus the right limb hangs almost helpless.

CASE VII.—Boy, aged ten. Similar history. Operation two years since. Now walks without cane or crutch, but usually uses cane. Cannot walk at all without apparatus.

Since writing this paper a number of cases (some of them accompanied by great distortions, even of the spinal column) have been operated on. The results have been most satisfactory.

CONCLUSIONS.—1. Even the severe resultant deformities of infantile paralysis are capable of being benefited by the skilful employment of surgical measures and mechanical appliances. No case with fairly strong upper extremities should remain in helpless cripplehood, since even crutch locomotion is far preferable to a life upon the floor or upon the bed.

2. The deformities following infantile paralysis can be largely prevented by the early use of some form of apparatus.

3. Surgical measures in long-standing cases should usually precede mechanical appliances, since pain and time are thereby saved, and the

resulting limbs are in nowise inferior to those obtained by the slower processes of mechanical rectification.

4. The surgical measures to be employed are tenotomy, myotomy, division of the fascia, application of force and resection. Osteotomy and amputation are sometimes necessary.

5. Mechanical appliances should be used to retain the limb in proper position, but they should not interfere with the circulation of the member. Crooked limbs can often be straightened so as to be made a part of the apparatus, and the muscles of these limbs should be compelled to do their full extent of work in supporting the body. The apparatus must frequently be made to support a large portion of the weight of the body, the helpless, flail-like limbs being accessories.

6. No case should be abandoned without the most careful and repeated attempts at rectification, as even feeble locomotion will in time become greatly improved by exercise in walking, and the health and happiness of the individual will thereby be greatly increased.

1818 Chestnut Street, Philadelphia.

THE TREATMENT OF CHRONIC PURULENT OTITIS MEDIA BY EXCISION OF THE CARIOUS OSSICLES AND REMOVAL OF OBSTRUCTIONS IN THE TYMPANIC ATTIC,

With a Report of Three Cases.[1]

By Christopher J. Colles, M.D.,
of New York.

In the present era of surgical advance and discovery, when operations entailing the removal of larger or smaller portions of the diseased economy are so freely and successfully undertaken, it might strike one as strange that one organ should be deprived of the gratifying results of such radical treatment. We remove without hesitation the cataract lens, resect diseased joints, snare off hypertrophied turbinate bodies, etc., and yet otologists, with but few exceptions, have been reluctant to remove from the middle ear portions of a diseased sound-transmitting mechanism, when the latter has lost, by long-continued destructive suppuration, all of its normal functions. They have contented themselves, up to the present time, with palliative methods of treatment, such as the insufflations of powders, the instillations of acids, caustics, with syringing, douching and the like. Everyone who has had much experience in the treatment of ear diseases knows well how numerous are the cases of chronic suppurative middle-ear inflammation, where all the ordinary methods of treatment seem to avail nothing. The discharge persists or returns after a short, quiescent period in spite of our usual local remedies. These cases are generally regarded as almost hopeless, the patients being often sent away finally with the advice to content themselves with simply keeping the ear clean. Such is the fact in many cases, and such the condition which persists for the remainder of their lives.

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[1] Read before the Hospital Graduates' Club of New York.

A brief glance at the local conditions in the ears of these patients will be necessary to illustrate clearly what it is desired to especially emphasize in this paper. On looking into the ear of such a case of long-protracted purulent discharge, we find a variety of conditions, all of which may be the result of the same source of trouble. In the one, the remnants of the drum-head will be adherent to the inner wall of the tympanum, usually above, forming pouches or pockets for the retention of secretions and shutting off the real seat of disease. Such act, furthermore, as barriers to the application of our local remedies. In other instances we note the entire absence of the drumhead, and the handle of the hammer is seen projecting freely downward into the tympanic cavity, or there remains only the carious head and neck of this ossicle almost concealed from view. In still other cases the carious malleus and incus (if the latter be present) are firmly attached to the tympanic walls by adhesions in all directions, thus filling up and closing off the natural outlet for the accumulating secretions from the upper chamber or attic of the typanum.

One frequently observes a group of cases, furthermore, where the drum-head is intact, excepting above the short process of the hammer, and here a sharply-defined perforation exists in the membrana flaccida. The purulent disease is here confined to the tympanic attic, and the ossicles, although to all appearances in a normal state, are generally more or less carious. Frequently also the temporal bone itself in the immediate neighborhood is likewise diseased. In some instances, a polypoid or granulation mass protrudes through such a perforation, having its starting-point in the attic or being attached to the carious ossicles. These "attic" cases are the most discouraging and difficult to handle, as they seldom yield to the ordinary methods of treatment. They have been frequently described and alluded to in the past twenty-five years by such authors as Von Troeltsch, Moos, Green, Blake, Burnett, Schwartze,[1] Kretschmann,[2] Kessel, Sexton, Stacke and others. According to Walb,[3] the involvement of the attic of the tympanum with consequent perforation of the membrana flaccida or Shrapnelli is, in a number of cases, a secondary one, the primary affection beginning with an ostitis of the bony margin to which the drum-head is attached. From thence the disease extends later on to the ossicles, at first, namely, to the hammer. Kretschmann[1] considers that the cavity of the tympanum is first involved, and following this the ossicles are attacked with caries, owing to the retention and decomposition of the secretions.

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[1] Naturforscherversammlung in Magdeburg, 1884.

[2] Archiv für Ohrenheilkunde, vol. xxv. p. 165.

[3] Ibid., vol. xxvi. p. 202.

In the cases just described it has been found that the ossicles, almost without exception, have become more or less carious in consequence of the long-existing purulent disease of the drum. Investigations in this direction were undertaken many years ago by both Gruber[2] and Von Troeltsch.[3] Schwartze,[4] in enumerating the different regions of the temporal bone as regards the relative frequency with which they become affected with caries, places the ossicles fourth in this respect.

Caries of the ossicles occurs frequently and is found in persons of all ages, says the same author,[5] the chief causes being acute purulent processes occurring with scarlet and typhoid fevers or with chronic suppurative inflammation in scrofulous and tuberculous persons. The incus shows defects from caries most frequently, then the malleus, the latter especially about its head. Ludewig[6] found among 32 cases of removal of the incus and malleus, the incus carious (malleus intact) in 11 cases, or 34 per cent.; both ossicles carious in 16 cases, or 50 per cent.; the incus carious, therefore, in 27 cases, or 84 per cent.

The stapes is seldom affected.[7] When the stapes shows carious defects it is usually on the arms and head of this ossicle where such are found, the foot-plate remaining intact. The latter fact is accounted for, probably, from the reason that this ossicle acquires its nourishment partially from the bloodvessels of the labyrinth,[8] and is thus better able to withstand the inroads of disease affecting the mucous lining of the drum cavity.

Every fresh cold acquired by such persons aggravates the ear trouble; the drainage being obstructed by the condition existing in the tympanum, the secretions accumulate, while their pressure on the neighboring sensitive structures causes more or less intense pain and suffering. In favorable instances they finally force their way outwardly into the external auditory canal, a procedure generally described by the patient as a "gathering and breaking" in the ear. Such persons suffer much from headaches, noises in the head and ears, vertigo, nausea and other distressing subjective symptoms, and their general health is usually a poor one.

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[1] Op. cit. [2] Wiener Medicinalhalle, 1863.

[3] Archiv für Ohrenheilkunde, vol. iv. p. 247.

[4] Chirurgische Krankheiten des Ohres, 1885, p. 387, et seq. Also: "Sitzungsprotokoll der Section für Ohrenheilkunde auf d. Naturforscherversammlung in Wiesbaden, 1873," Archiv für Ohrenheilkunde, vol. viii. p. 226.

[5] Ibid.

[6] "Ueber Ambosscaries und Ambossextraction, ein Beitrag zur Aetiologie und Therapie der chronischen Mittelohreiterung," Archiv für Ohrenheilkunde, vol. xxix. p. 241. Also: Bericht über die Thätigkeit d. königlichen Universitäts Ohrenklinik zu Halle a. S. vom 1ten April, 1888, bis 31ten März, 1889. Same vol. p. 263.

[7] Schwartze: Beiträge zur Pathologie u. path. Anatomie des Ohres. See also: Die chirurgischen Krankh. d. Ohres, p. 389. Also: E. Wetzel, "Excision des Trommelfells, etc." Inaugural-dissertation, Halle, 1889. p. 8. [8] Ibid.

It must be borne in mind that we are dealing now with cases which have undergone the ordinary methods of treatment for a longer or shorter period without deriving any permanent benefit from such means, and have been given up as nearly hopeless. That removal of these sources of irritation should be followed by healing of the parts affected seems a very natural and warrantable conclusion.

In those cases, however, where, owing to prolonged suppuration, the temporal bone in the immediate neighborhood of the tympanum has become affected, it cannot be expected that removal of the carious ossicles will be followed by immediate cessation of all discharge and recovery of the patient. But we know that removal of these obstructing tissues and the breaking down of the adhesions and pockets in the tympanic cavity affords free drainage and permits of better application of local remedies. The danger, furthermore, from the blocking up of the discharge during acute exacerbations consequent on colds in the head, etc., is removed.

Much more might be mentioned concerning the condition of these patients, but space will not permit us to go deeper into the subject. Enough has been said, however, for those interested, to demonstrate the conditions existing in those cases where the treatment about to be described is considered advisable and of great practical value.

Kessel,[1] Schwartze,[2] Kretschmann,[3] Sexton,[4] Stacke,[5] Burnett,[6] Wetzel,[7] Ludewig,[8] Urbantschitsch,[9] and others agree practically as to the indications for excision in cases of chronic otorrhœa. "Excision of the drum-head and extraction of the hammer, also of the incus," says Schwartze, "is indicated in chronic purulency of the middle ear with caries of the ossicles, and in cases of cholesteatoma of the tympanum."[1] In this he simply emphasizes what Kessel had already stated. Stacke[2] tells us that the operation is indicated in cases of total loss of the membrane, if, as is usually the case, remains of the hammer are still present, and granulations, exposed or roughened places of bone in the upper portion of the tympanum (attic) point to an active involvement of this region. In those cases just described, where a perforation above the short process of the hammer in the membrana flaccida exists, and which compose the most protracted cases of otorrhœa, removal of the entire membrane together with extraction of the malleus and the incus (if present), providing free drainage, will also affect a cure, says Stacke. In such cases he prefers excision of the malleus to "all other methods of treatment, the more so since the functional results of the operation are much more favorable than by the conservative treatment."

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[1] Archiv für Ohrenheilkunde, vol. xvi. p. 196. Also: Correspondenz-blätter des allgemeinen ärztlichen Vereins von Thüringen, 1887, No. 9.

[2] Chirurgische Krankheiten des Ohres, 1885, p. 280, et seq.

[3] Archiv für Ohrenheilkunde, vol. xxiii. p. 234; also: vol. xxv. p. 165.

[4] The Ear and its Diseases, 1888, p. 368.

[5] Archiv für Ohrenheilkunde, vol. xxvi. p. 115; also: "Betrachtungen über den gegenwärtigen Stand der Therapie chronischer Mittelohreiterungen, u. s. w.," Berliner klinischer Wochenschrift, 1889, No. 16.

[6] Trans. American Otological Society, Sept. 18, 1888, and July 15, 1890. Also: The Medical News, November 2, 1889.

[7] "Die Excision des Trommelfells und der beiden äusseren Gehörknöchelchen, als Heilmittel chronischer Otorrhoe." Inaugural-dissertation, Halle, 1889.

[8] Archiv für Ohrenheilkunde, vol xxix. p. 241.

[9] Lehrbuch der Ohrenheilkunde, 3te Auflage, Wien und Leipzig, 1890, p. 372.

To quote from another writer[3] on the subject: "When the drum is encumbered with objects now useless and diseased, but which once composed the transmitting mechanism, it is also often a reservoir for purulent secretion; in other words, the drum has lost its normal functions and has become a source of infection for the system. By excision, more or less obstruction to hearing is removed and the septic influences are eradicated."

All authorities agree from their observations that the disagreeable subjective phenomena often accompanying chronic suppuration of the middle ear, as headaches, noises in the head and ears, vertigo, nausea, etc., may be entirely relieved by removal of the diseased structures filling up the drum cavity. Sexton[4] states: "Subjective phenomena alone, in some instances, are so distressing that the operation for their relief seems justifiable even when good hearing exists."

From the observation of many cases occurring in the practice of the last-mentioned author, the writer can readily agree in this opinion, and as to the favorable results obtained by operation in the case of these necrotic tissues.

In searching the literature of the subject it is interesting to note some of the results obtained by different operators. Schwartze seems to have been the first (1878) to undertake excision in cases of chronic otorrhœa.[5] J. Kessel, however, reported a case of removal of the ossicles for the relief of persistent chronic purulency in 1879.[6]

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[1] See also: Bezold, Friedrich, "Cholesteatoma, Perforation der Membrana flaccida Shrapnelli und Tuberverschluss, eine aetiologische Studie," Zeitschrift für Ohrenheilkunde, vol. xx. i. p. 5.

[2] Op. cit.

[3] Sexton.

[4] Op. cit.

[5] Op. cit., p. 287.

[6] Archiv für Ohrenheilkunde, vol. xvi., 1880, p. 196.

The patient, a female, aged twenty-three years, had suffered with otorrhœa (right) since childhood. The discharge ceased in eight days after the operation, also the distressing tinnitus. Before the operation the voice could not be heard at all; after excision ordinary conversation could be heard at the distance of one metre.

In 1887 Kessel tells us that he has performed the operation in more than 100 cases, and with the most gratifying results.[1] Schwartze has been for many years an ardent advocate of this procedure; some 28 of his cases operated at the Ear Clinic at Halle were recently reported by E. Wetzel.[2] Ludewig[3] has also lately published 32 cases of excision of the incus and malleus, gathered from the same sources.

Kretschmann, Stacke, Sexton, C. H. Burnett, and Colles[4] have also reported many cases, and all demonstrate the beneficial results of this treatment.

Of 120 cases compiled from the sources mentioned and in which the details are more carefully reported, we find that in 60 per cent. the otorrhœa was cured, and in only 4⅙ per cent. unimproved, whilst the remaining cases resulted in more or less marked improvement in this respect. The hearing improved in 63 out of 120 cases, or 52½ per cent., in many of them to a remarkable degree. In two cases reported by Wetzel, the hearing became worse; in the one the stapes was removed by accident, whilst in the other case the mastoid antrum was opened at the same time that excision was done.

Even in those cases where the otorrhœa did not cease entirely, owing to a carious condition of the neighboring bony walls, such subjective symptoms as headaches, tinnitus aurium, vertigo, etc., are reported to have either ceased entirely or have been greatly diminished in intensity.

All authorities on the subject agree as to the danger-less character of the operation. No case of fatal results has been reported up to the present, and it is difficult to see why such should oocur if ordinary precautions are exercised. In a few cases temporary facial paralysis has followed, but for a short interval only. It is probable that in these cases the canalis facialis was already greatly involved in the destructive process. Regarding the operation itself a brief description will be necessary. For the purpose of illumination an electric head-light is decidedly better than the ordinary light used in examination. The lamp (6 to 8-candle power) is attached to the head-band like a mirror. Complete immobility of the head is secured by narcosis. After the ear has been thoroughly cleansed, the remains of the drum-head are cut away with a small spade-shaped knife, or a small straight-bladed, blunt-pointed knife may be used with advantage; the attachments of the malleus are divided with either of these instruments. The latter bonelet is then seized with a dressing forceps and brought away. Some operators prefer the wire polypus snare-loop for the removal of the malleus to the ordinary dressing forceps, but this is simply a matter of individual taste. The foreign-body forceps of Sexton has proved itself of great value for this purpose. Lucae[1] uses an instrument resembling a small lithotribe. If the articulation between incus and stapes is intact, it may be divided with a small knife the blade of which is bent at an obtuse angle to the shaft. In many cases it will be found very difficult to bring the incus down into view, and in many others this ossicle will not be found at all, having become destroyed by disease and swept out during the course of the discharge. In some cases it may become dislodged during the operation backward and upward into the mastoid antrum. Ludewig[2] opens the antrum in such cases where he suspects the latter accident to have taken place, in order to remove the dislodged incus, if possible. As far as his own observation goes, however, the writer considers this procedure unnecessary. For bringing the incus down into view, Kretschmann[3] uses an instrument the extreme end of which is bent to a right-angle with the shaft, and having on its point a cup-like bulb. Ferrer[4] and Ludewig have both devised small hook-shaped instruments for this purpose. An ordinary malleable probe, bent to the angle desired, is, however, very effective for the object mentioned. When brought down into the atrium the ossicle is extracted with the forceps. All adhesions and pockets existing in the tympanic cavity, especially in the attic, should be broken down, making free drainage possible. Hæmorrhage from granulations sometimes prolongs the operation, but is easily controlled by syringing with hot water. As a rule, however, bleeding does not interfere much and may be stopped by wiping out with cotton-wool tampons.

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[1] Correspondenz-blätter des allg. Aerztlich.-vereins von Thüringen. 1887.

[2] Op. cit. [3] Op. cit.

[4] "Ueber 13 Fälle von chronischer Otitis Media, behandelt durch Excision der Gehörknöchelchen; nebst Bemerkungen," Deutsch. med. Wochenschr., 1889, No. 28.

There is very rarely any pain after the operation. Should it occur, it can be easily controlled by the instillation of a few drops of a 4 per cent. solution of cocaine.

In conclusion, the writer desires to give the histories of the following three cases, operated by himself, and which he trusts may not be without interest.

Case I.—Male, aged forty-four years. Discharge from both ears for many years. Under treatment by different aurists during past six to seven years, with no improvement to speak of.

Membrana vibrans of both ears is absent, and there is a slight amount of granulation tissue in both tympana. Malleus and incus of right ear absent; in the left the malleus is present, retracted and adherent to the inner wall of the drum. Came to writer in December, 1887. Hearing about the same in both ears: loud voice at two feet, and very loud voice at five feet distance. Excision of malleus of left ear June 18, 1888. Ether narcosis. The extraction of malleus was difficult on account of thick cicatricial bands running in all directions and binding the bonelet firmly to the tympanic walls. Hæmorrhage slight. Incus not found. Malleus shows evidences of caries about head and neck. No reaction, excepting a slight swelling of the canal, lasting a few days. Hearing improved slowly but surely. By the middle of November—*i. e.*, five months after the operation, he could easily hear and understand sentences spoken in ordinary voice at twelve feet. Discharge ceased in one month's time, and the membrana tympani regenerated partially. Patient was last seen in October, 1890, over two years since excision was done. The operated ear was dry and cicatricial. The improved hearing remains and his health is excellent.

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[1] Archiv für Ohrenheilkunde, vol. xxii., 1885, p. 233.

[2] Op. cit.

[3] Archiv für Ohrenheilkunde, vol. xxv.

[4] Vide Ludewig, op. cit.

Case II.—Female, aged twenty-five years; has suffered with discharge from left ear since childhood. The right ear discharged also formerly, but is now healed. At times the discharge from left ear ceases altogether for longer or shorter intervals; then she takes a cold and the ear "gathers and breaks." Much pain and soreness in the ear at times. Run-down, anæmic individual, nervous, and suffers much with headache. Left drum-head is absent in its lower segment, and the handle of the hammer hangs freely down into the drum-cavity. She hears in the left ear loud ordinary voice at five feet, and loud voice at ten feet only. Excision of malleus of left ear December 5, 1889. Ether narcosis. The handle of malleus adherent to inner wall of tympanum. Slight hæmorrhage only. No pain. Walls of canal swelled slightly, but soon subsided. Hearing began to improve within four or five days, as the swelling of the canal-walls subsided. A week after the operation she heard ordinary voice at ten feet. Discharge ceased within two weeks. Patient lives in the country and was not seen until November, 1890, when she came to the writer's office. Can hear now low voice easily at twelve to fifteen feet. Tympanic cavity is dry and cicatricial, presenting a glistening appearance. No regeneration of membrane. Health excellent. Never has headaches now.

Case III.—Female, aged ten and a half years, with discharge from both ears after scarlet fever in infancy. Child much neglected, and her general condition a poor one. During treatment, continued for many months, a number of polypi were removed from both ears. The condition of these, however, remains about the same. In both drum-heads the lower portions are absent. In the right ear the malleus handle hangs freely down into the drum-cavity; in the left the head of the malleus alone remains and is firmly ossified to the tympanic plate. Hears with right ear ordinary voice at three feet, and loud at twenty feet; in left ear loud voice at three feet, and shouting at twenty feet. March 21, 1889, excision, under ether, of malleus of right ear. Extraction easy and hæmorrhage slight. The ossicle is carious and the tip of the handle is wanting. Incus not present. No reaction. Hearing showed improvement at once to low voice at two feet, ordinary at five feet, and loud ordinary at ten to twenty feet distance. By April 8th the discharge had ceased entirely and the ear was perfectly dry. Patient's health improved much after this, and when last seen, in December, 1889, she was in excellent condition. The operated ear was dry and cicatricial, and the improved hearing remained.

In these cases it will be seen that excision was followed not only by cessation of the disagreeable discharge, but by a very considerable improvement in hearing. The bare record of the degree of the improvement in the hearing power of such patients may not appear so great to us, but we must regard it from their point of view to properly appreciate the value of the amount gained.

The same remark, indeed, may be applied to the result of any surgical procedure. This improvement in hearing, however, in connection with the removal of the diseased and obstructing tissues, is a gratifying occurrence in the cases I have endeavored to describe. Such purulent conditions are not only disagreeable and annoying to the patient, but a constant menace to his existence. To quote from a recent German writer on this subject, "the result *quoad vitam* should be more highly valued than *quoad functionem.*"

30 West Thirty-third Street, New York.

CASE OF EPILEPSY CURED BY ANTIPYRINE.

By McCall Anderson, M.D.,
PROFESSOR OF CLINICAL MEDICINE, GLASGOW UNIVERSITY.

Reported by William R. Jack, M.B., C.M.,
HOUSE PHYSICIAN.

J. M., aged nine years, was admitted to Ward 2 of the Western Infirmary on December 12th, 1889, suffering from "fits" of two and a half years' duration.

His father stated that he had previously been perfectly healthy. In both father and grandfather there was a history of so-called "hysterical fits," in the father between the ages of two and four, and in the grandfather between those of forty-five and fifty-seven. An aunt had a "stroke" twenty years ago, from which she recovered, and is still alive.

Six weeks before the first fit, the boy had a fall, bruising his head just above the right ear, but there was apparently no injury to the bone. He recovered from this in about three days, and remained well until the first fit occurred, for which the parents can think of no other cause but the fall. At the beginning of the illness he had only about four to six fits daily, but they gradually increased in number until he had as many as thirty or forty. At the same time he complained of gradually increasing weakness in his right arm, but this after a time disappeared, while the left became similarly affected. Three months afterward the fits entirely ceased, after the application of blisters to the head. An interval of fifteen months ensued, during which there were no fits, and throughout this time the general health remained perfectly good. About seven months before admission, with no apparent cause, they began again, at first only one occurring in twenty-four hours, but gradually they increased until they amounted to forty or fifty, the largest number in one day having been fifty-seven. There was no improvement until a few days before admission, during which time he had had only twelve daily. The fits occur in sleep as well as while he is awake. They are sometimes preceded by pain in the left elbow, sometimes by headache, now frontal, and now situated on the side of the head, over the right ear. The headache sometimes only occurs immediately before the fits, and is sometimes of longer duration. Occasionally three or more fits occur together with very little interval, but there appears to be no status epilepticus. Drowsiness, lasting for a few minutes only, often succeeds the convulsion. The right side was at first the more severely affected, but now is considerably less so than the left. The patient is perfectly intelligent.

Numerous fits were seen, both by the house physician and by the nurses, and all presented similar characters, their duration being from one and a half to two minutes. In all, with the commencement of the tonic spasm the arms were thrown over to the right side, and either both rigidly extended or the right flexed at the elbow and the left extended. The thumbs were bent into the palms. At the same time the head was violently twisted to the right, so as to look over the shoulder, and the eyes were rolled upward and to the right. Clonic convulsions followed, especially violent upon the left side, except in the face, where they occurred upon the right, and involved chiefly the zygomatici and the lower half of the orbicularis palpebrarum. The mouth was kept half open, and there was no foaming. The tongue was not bitten. Nearly all the fits were preceded by the epileptic cry. As consciousness was recovered, the patient sometimes burst into tears. There was occasionally incontinence of urine during the fits.

On examination, all the organs were found normal. The gait was awkward and unsteady; shortly after a fit there was slight exaggeration of the left patellar tendon reflex, and an approach to ankle clonus on the right side. There was a continuous dilatation of both pupils, which responded normally to light. Examined again on December 22d, one and a half hours after a fit: there seemed to be slight paresis of both upper and lower limbs, the left side being apparently a little weaker than the right. The dynamometer in the left hand registered 32, in the right 30.

The treatment, which was commenced on December 20th, consisted of rest in bed, careful regulation of the bowels, and the exhibition of antipyrine, commencing with gr. v thrice daily, and increasing by gr. j in every dose each day. On January 9, 1890, gr. xxv thrice daily were reached, and this dose was continued till January 16th, when it was diminished to gr. xx thrice daily. From the date of entrance till December 26th the average number of fits daily was 16.5; from then till December 30th, 13.2. On December 31st and January 1st there were eleven fits; on January 2d and 3d, ten fits; and on January 4th, three fits. The fits then ceased till January 28th, when the dose of antipyrine had been lowered for twelve days. There was then one slight fit, and the dose was again increased to gr. xxv thrice daily. From that time there were no more fits, and the patient was dismissed on March 1st, quite well. He continued the antipyrine at home, and a letter from his father, dated March 12th, stated that there had, up till then, been no recurrence.

This was a most aggravated case, and the result was striking and remarkable. That the cessation of the fits was directly due to the drug is shown by the fact that they were arrested when the dose of antipyrine reached twenty-five grains, reappeared when it was reduced to twenty grains, and finally ceased when twenty-five grains were again administered. For a boy aged nine years the dose was a large one; but, as regards dosage, it should never be forgotten that each case must be treated on its own merits, and that we must not be tied down to regulation doses. The rule which I invariably follow in such cases is to begin with a small dose and slowly increase, either until the medicine begins to disagree, or until the symptoms begin to yield, the patient being, however, carefully watched during the whole of the treatment. It is also of the utmost importance in cases of epilepsy to continue the treatment for a long time after all trace of fits has disappeared.

I was led to employ antipyrine from the conviction that epilepsy is a pure neurosis, from a knowledge of the powerfully calmative influence of antipyrine upon the nervous system, and from the observation of its wonderful effects in many cases of chorea, another form of neurotic affection.

EXTENSIVE FRACTURE OF THE SKULL WITH REMARKABLE PERSISTENCE OF LIFE.

By C. G. R. Jennings, B.A., M.D.,
BENNINGTON, VERMONT.

On the evening of December 11, 1888, I was called to see Louis Walder, German, aged fifty-six years, woodchopper by occupation, who had received an injury of the head in a quarrel. I found him in a condition of stupor from which he could be only partially aroused. Upon examination, a contused wound of the scalp in the left parietal region was found extending down to the skull, which was fractured and depressed.

After preparation for operation, the whole head was shaved and rendered as nearly aseptic as possible. Owing to the squalor and dirt amid which I found him in his hut on the mountain side, it was difficult to make an ideal operation. With the assistance of Dr. Lyman Rogers, I explored the wound. The patient felt the knife and it was necessary to put him under the influence of chloroform. We observed that he had right hemiplegia. He also had right facial paralysis and as we afterward learned, aphasia. After removing a portion of bone which occupied the centre of the wound, we were able to raise the surrounding bones, which were depressed over an area of three inches square. We found profuse hemorrhage from branches of the middle meningeal artery. This was checked by pressure with hot sponges, but only after considerable time and much bleeding. The dura mater was punctured underneath the centre of the wound, but we did not think best to interfere with this. The puncture was small and clean, and we found no evidence of laceration of the brain by the puncture. Having elevated the bones we dressed the wound with carbolized gauze and iodoform, leaving abundant provision for drainage. When we left the patient we did not expect to see him alive again.

From this time on the patient continued to live and did well. For a few days it was necessary to catheterize him, but after that he passed urine naturally, although he had incontinence. For a week or more his bowels did not move. We administered salts, rectal enemata, and croton oil. Twice I gave him seven drops of the latter. Finally, his bowels moved and after that gave very little trouble.

The aphasia began to pass off after several days so that under some mental excitement he would talk freely, but his language was incoherent and consisted largely of a repetition of oaths. Usually he would say simply " Yes " or " Yah " in answer to every interrogation. There was only slight improvement in the facial paralysis. The patient was able to take plenty of nourishment and often had a good appetite. The wound was healing nicely. He gave no evidence of meningeal inflammation nor of cerebral abscess.

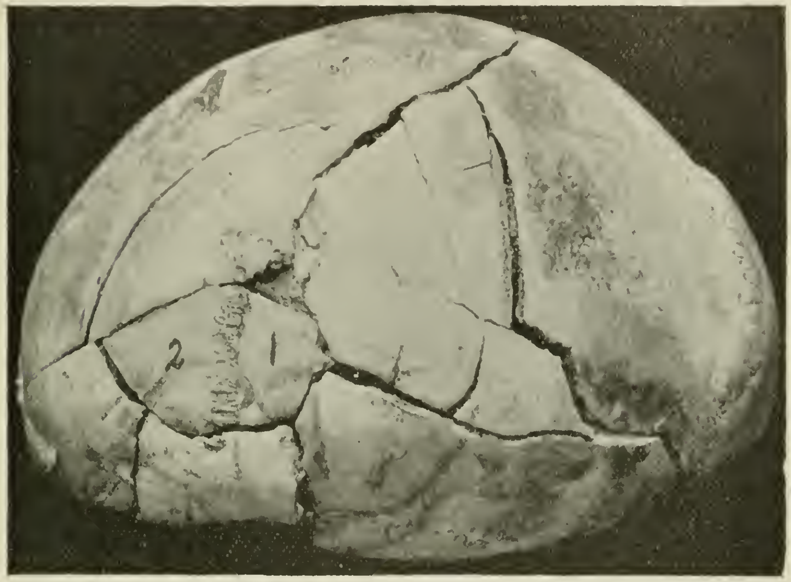
On December 24th I operated again, having decided to make an exploratory operation. It was evident that there was still an interference with any considerable improvement in his condition beyond that already noted. With the patient under chloroform I made ample incisions upon the site of injury and turned back the flaps of scalp and temporal muscle until I obtained a clear view of the fracture over a space of four inches square. It was then made evident that the man had received a most terrible injury. The lines of fracture passed in several directions beyond the limits of the area exposed. While attempting to lift depressed bone I found that very large plates of bone were loose. The sense of touch told me that the bones were movable over the whole area of the vertex and even beyond. It was evidently impossible to retain all the fragments in good elevation. A piece of bone (2 in fig.) which was threatening to necrose was removed. Another (1 in fig.) had been removed at the previous operation.

There was one spot where the brain resistance was less than elsewhere and which had a semi-fluctuating feel. Upon consultation it was not thought best to make further exploration. The dura mater was healthy, and the tear in it which we observed at the first operation, had healed. This wound of the dura and the spot of diminished brain resistance were about half an inch apart. We used four catgut sutures for the four arms of the X-shaped incision in the scalp. The middle of the scalp incision was left open for drainage and to avoid any cerebral pressure.

The patient was a little depressed by this procedure, but in two days rallied and began to do well. There was some improvement in the paralysis of the leg, but in other respects he remained about the same until his death on the 17th of January.

A post-mortem examination was made January 18th. Rigor mortis well marked on the left side. Body emaciated. Height 5 feet 4 inches. Well-marked contusion on outer aspect of left shoulder, of not recent date. Bed-sores over left trochanter and over sacrum and right trochanter. A few small adhesions in left pleural cavity, easily broken down. Slightly increased amount of serum in pericardial cavity. Small completely decolorized fibrinous clot in left ventricle extending into aorta. Larger partially decolorized fibrinous clot in right ventricle extending into pulmonary artery. Both lungs exceedingly œdematous and slightly congested.

Ecchymosis under the scalp diffused over a large portion of the cranium. The cranium itself fractured over the left motor tract into thirteen or fourteen pieces, four of the lines of fracture traversing the vault of the skull toward the base. These four fissures were from six to ten inches long. One passed anteriorly to the upper margin of the orbit and was thence reflected along the base of the anterior fossa to the olfactory groove of the left side. The second fissure reached the middle fossa of the base of the skull on the left side and extended to the hiatus Fallopii. A third fissure extended backward, reaching the left half of the lambdoid suture, thence passing downward nearly to the lateral sinus. A fourth fissure or crack extended from the site of the wound across the vertex of the skull toward the right side and terminated just at the angle of the groove for the right lateral sinus, about ten inches from its starting-point. Three pieces of bone were missing from the site of the injury, having been removed at the two operations. Dura mater lacerated in three places under the three principal lines of fracture. Repair had partially taken place. Dura mater firmly adherent to pia mater in several places. Slight congestion of the pia mater.



Under one place of adhesion between dura and pia, near the vertex, is a spot of softened brain substance of small extent. In the motor convolutions of the left side, immediately in front of fissure of Rolando, is a larger spot of broken-down brain tissue and blood-clot the size of a robin's egg.

The immediate cause of death was œdema of the lungs. The antemortem clot in the left ventricle of the heart had not given any symptoms prior to death, excepting by its effect on the circulation in the lungs. The patient lived five weeks and two days after the injury.

REVIEWS.

A Manual of Auscultation and Percussion. By Austin Flint, M.D. Fifth edition. Revised by J. C. Wilson, M.D. Philadelphia: Lea Brothers & Co., 1890.

It seems almost a work of supererogation to review a manual so well known to the profession, and which has with this reached its fifth edition.

Among the many treatises upon the examination of the thoracic viscera, that of Flint, as revised by Dr. Wilson, will still hold its place. As the reviser remarks in his preface, "Its value is to be discovered in the clearness and appropriateness of its style, the accuracy of its statements, its scientific method, and the practical treatment of subjects at once difficult and essential to the student of medicine."

In the first chapter, the introduction, the author refers, among other matters, to the importance of the physical signs and the morbid conditions incident to the different respiratory diseases, and gives a useful enumeration of these latter. There are also several illustrations accompanying the description of the regional divisions of the chest; and an explanation of the mutual topographical relations of the viscera found in each region.

In the next chapter, percussion in health is thoroughly discussed, and its characteristics, as found in the different regions, described. Stress is laid upon the differences in the percussion note occurring in corresponding areas upon the opposite sides of the chest. The chapter closes with practical "rules for the practice of percussion."

The same subject in its relation to disease is treated of in the third chapter, with the description of the various percussion notes which may occur, and an examination of the various pulmonary conditions producing them.

Chapter IV., on auscultation in health, opens with brief remarks upon stethoscopes; the author expressing with no uncertain voice his preference for the double stethoscope. The chapter includes "rules for the practice of auscultation," as well as descriptions of the different normal auscultatory sounds. Of particular value is the careful, concise description of the variations in the character of the respiratory murmur and vocal resonance heard at different portions of the normal chest.

The following chapter is occupied by a consideration of auscultation in disease. The author gives a systematic analysis of the various abnormal auscultatory sounds, and of the manner in which, and the conditions by which, these are produced. He calls attention to the close resemblance which he says cavernous respiration often bears to normal breathing, and denies it any participation whatever in the bronchial character.

In this particular he is, as he admits, at variance with some writers.

On the other hand he describes a broncho-cavernous and vesiculo-cavernous respiration. He emphasizes, too, the diagnostic value of carefully noticing pitch and quality in prolonged expiration, and thinks that this matter has been too much neglected by medical writers. In discussing râles he speaks of the vesicular or crepitant râle as almost absolutely diagnostic of pneumonia, and believes that the crepitation often heard in apical phthisis is due to the development of a circumscribed pneumonia secondary to phthisis.

Chapter VI., on the physical diagnosis of diseases of the respiratory apparatus, takes up the grouping of the various physical signs already described. The different pulmonary diseases are reviewed in succession, and the differential diagnosis discussed. This chapter is an exceedingly valuable one, and contains so much of importance that it is impossible to analyze it here.

A striking feature in the portion of the book devoted to the study of the lungs is the frequent reference, already mentioned, to the differences obtaining between the physical signs in corresponding regions on opposite sides of the chest. This is a matter to which too much attention can scarcely be called. A further feature is the incorporation of the author's published observations upon the resemblance of the sounds produced in physical study of the lungs to those which may be artificially produced; as, for instance, by percussing a loaf of bread, and the like.

In opening the discussion of the physical study of the heart, the author first describes the physical condition of the heart in health, including its exact position in the thorax, the nature of the different heart sounds, and the mechanism of their production. He claims that the impulsion of the heart against the chest-wall is one of the principal factors in producing the first sound—a statement very largely denied at the present time. Next follow descriptions of the physical conditions of the heart in disease; the chief attention, of course, being paid to cardiac murmurs. Among the features to be noted in this connection is one at variance with the teachings of some authorities. This is, namely, the distinction which Flint makes between the mitral direct and the mitral diastolic murmurs. The former he believes to be brought about by the contraction of the auricle just before the first sound is heard. The latter he deems the result of the passive flow of blood into the ventricle during the whole of the diastole. In the latter a stenosis of the mitral orifice is presupposed. It is a noteworthy fact, however, as Lees in a recent article in THE AMERICAN JOURNAL OF THE MEDICAL SCIENCES has pointed out, that Flint years ago maintained the possibility of the production of the mitral direct murmur without the existence of any mitral disease. The abnormal sound in such a case is the result of the impinging of blood, as it regurgitates through an insufficient aortic orifice, upon the outside of a mitral leaflet. The cases collected by Lees show the truth of this almost forgotten statement.

The author opposes the view that mitral regurgitant murmurs are ever heard loudest at the pulmonary cartilage.

The last chapter of the book is allotted to the physical diagnosis of diseases of the heart and of thoracic aneurism.

A general commendation of the manual is scarcely needed. It is, as the reviser states, "already a medical classic." Both students and practitioners will find condensed in its pages most lucid instruction in the department of which it treats. J. P. C. G.

ON SEVERE VOMITING DURING PREGNANCY. A Collection and Analysis of Cases, with Remarks on Treatment. By GRAILY HEWITT, M.D. Lond., F.R.C.P., F.R.S. Ed., Emeritus Professor of Obstetric Medicine, University College, etc. etc. Pp. 147. London: Longmans, Green & Co., 1890.

THIS monograph, as the distinguished author states in the preface, is based upon his able essay, which was read before the American Gynecological Society in 1889. Its object is to prove not only that the severe vomiting of pregnancy is of uterine origin, but that it is due directly to pressure upon nerve filaments in the cervix, especially around the os internum, induced by one of three factors—marked ante- or retroflexion, rigidity of the tissue of the cervix, or impaction of the body of the uterus in the pelvis. The evidence presented in support of this theory is certainly most convincing, though the thoughtful reader may object to the argument being pushed too far. When we remember that anteflexion is the normal position of the intra-pelvic gravid uterus, we cannot overcome the suspicion that mere flexion is not enough to explain the reflex irritation in some of these cases, especially those in which the vomiting is suddenly checked by an application of nitrate of silver to an accompanying eroded cervix. But, *facts* are better than theories, and it must be admitted that the author presents a powerful array of the former. Those who have tried Copeman's method must admit that its success is due to something more than mere straightening of an anteflexed uterus. It is employed quite extensively in America where the object aimed at is dilating a rigid os internum without any distinct attempt at replacing the uterus. The comparison between cases of vomiting in displacements of the gravid and of the non-gravid uterus is an ingenious one, as well as the idea that morning sickness is due to sudden pressure upon the cervical nerves, from ante-displacement of the uterus following the change from the recumbent to the erect posture.

The chapter on treatment is, as might be inferred from the foregoing, largely mechanical, replacement of the ante- or retroflexed uterus being the main object to be aimed at. It must occur to the gynecologist that the Gariel air-pessary tends rather to elevate the uterus *en masse* than to make pressure upon the fundus alone, thus correcting an anteflexion. But here again, facts are better than theories. The dicta of such a cautious observer as Dr. Hewitt should be received with the greatest confidence, and the profession must certainly feel grateful to him for presenting this obscure, but important, subject in such a lucid manner.

H. C. C.

FLUSHING AND MORBID BLUSHING: THEIR PATHOLOGY AND TREATMENT. By HARRY CAMPBELL, M.D., B.S. (Lond.), M.R.C.P. (Lond.), Senior Assistant Physician and Pathologist to the Northwest London Hospital. Large 8vo., pp. 270, with two colored plates and seventeen woodcuts. London: H. K. Lewis, 1890.

IT is rather remarkable that such a common symptom as flushing, and one so annoying, has not heretofore received more careful study, The author was unable to find a single paper treating it as a distinct neurosis. He has considered his subject in minute detail, and has utilized observations upon some 550 cases of his own. Very wisely, a knowledge of the physiology involved has not been presupposed, but Part I. is devoted to the structure and function of the skin, to the vasomotor system, to blood-pressure, and to some points in the physiology of the nervous system, which are illustrated by colored plates.

He finds that there are several vascular systems in the skin, one for the papillæ, others for the sebaceous glands, for hair follicles, and for sweat-glands; that each system has a separate vasomotor apparatus, and that any one of these may be affected independently of the others. He lays particular stress upon this last point, and so accounts for sweating from a pale skin, dryness of a flushed surface, etc.

The nerve supply of the skin is, as he states, also elaborate, but that "every epithelial cell" in the glands of the body "has its nerve-twig" is rather a matter for inference than for positive statement. Secretory and trophic nerve impulses are confounded in the description of gland secretion (p. 5).

The author adopts the generalization of Hughlings Jackson, that all parts of the body are represented in the highest cerebral centres, and applies it literally in his study of the flush. This is described as a highly complex nerve-storm, of which the three typical cutaneous phenomena, sweating, chilliness, and reddening, are merely surface indications. It is not considered to be essentially vasomotor. An analysis is given of surface points where flushes begin, and a parallel is suggested with certain epileptic and hysterical auræ; indeed, attention is called to the difficulty in separating some flushes from *petit mal.* The sensations of heat and cold are considered to be independent of afferent nerve impulses. Sweating is shown to be independent of vasomotor conditions, and also of the sensation of heat in some instances. An analysis of ninety-six cases points toward the conclusion that perspiration with the flushes of the menopause is vicarious. The vast majority of flushes are found to have some relation to disordered or changing menstruation.

Physiologically, flushing and blushing cannot be separated, and the only safe distinction is that the blush is always caused by emotion, while the flush is only occasionally so caused. Morbid blushing depends upon shyness, and this upon excessive self-consciousness (as shown by Darwin), upon want of self-esteem, and upon undue sensitiveness to the opinion of others. A few cases were observed where it occurred in the dark, and when the person was alone.

About one-fourth of the book is devoted to treatment. This is considered broadly, and considerable space is given to theories of cell nutrition. Healthful development of the nervous system in childhood is of supreme importance. School life is useful in checking functional nervous disease, as compared with over-watchful home training. The treatment advised for the adult is essentially hygienic. Bleeding may benefit, especially after the menopause. Among drugs turpentine is frequently useful, especially among the poor, while iron takes a high place. Bromides have little influence.

While the work is at times a trifle theoretical, it it a careful, painstaking study, scientific in spirit and in method. The work of the publishers has been most creditably done. G. E. S.

THE TECHNIC OF LING'S SYSTEM OF MANUAL TREATMENT AS APPLICABLE TO SURGERY AND MEDICINE. By ARVID KELLGREN, M.D. (Edin.) Edinburgh and London: Young J. Pentland, 1890.

THE title of this work is misleading, as we expected to find a somewhat complete analysis of the different movements used and recommended by the venerable Pehr Henrik Ling. A better title for this work would be, "Manipulations and Swedish Movements, with Special Attention paid to Mr. Henrik Kellgren's Nerve Vibrations." The author does not thoroughly exemplify the title of the book, which can be easily understood when we consider the fact that out of 108 pages devoted to all the various movements of Ling, we find that 35 are given to the nerve vibrations devised by the writer's brother.

It is to be regretted that the author does not give due consideration to Dr. Metzger and his admirable work. In treating of the system of massage, the author differs from all other writers in almost excluding that exceedingly important manipulation, friction. There are several other manipulations and movements (recommended by P. H. Ling) used by hundreds of skilful operators from the Swedish schools totally omitted —and replaced by these omnipotent "nerve vibrations." There has scarcely been a work on this subject published lately in which the author has not referred to Henrik Kellgren's vibrations as hazardous and useless (see Kleen, Reibmayer, Gustafsson, etc.), especially when recommended as a specific for inflammation of the lungs, acute inflammatory gastro-intestinal catarrhs, peritonitis, etc. They are, however, introduced in this work with the name of the venerable originator of mechano-therapeutics as an endorsement.

Some of the illustrations are very well developed, and are of great assistance to the reader. There are many good practical hints throughout the book, and one who is familiar with Henrik Kellgren's institutions in England and on the Continent can observe that the author has had all the instruction possible from his brother Henrik, who, although himself an unusually skilful operator, has by these vibrations carried mechano-therapeutics too far, the more so as he is not a graduate of medicine.

The book has many good points, but should be read with discrimination.

K. W. O.

THE PHILOSOPHY OF TUMOR DISEASE: A RESEARCH FOR PRINCIPLES OF ITS TREATMENT. By C. PITFIELD MITCHELL, M.R.C.S. (Eng.), author of "Dissolution and Evolution and the Science of Medicine." Williams & Norgate, 14 Henrietta Street, Covent Garden, London, and South Frederick Street, Edinburgh; G. P. Putnam's Sons, New York, 1890.

IT is very refreshing, in these days when so little thinking and so much observing is being done in medicine, to meet with such a book as that before us, in which the author endeavors to develop and verify a new conception of tumor disease, a conception which in its broad generalization attempts to explain all the known facts as to the structure, nature and origin of tumors. This conception is not the product of a sudden inspiration, but is an hypothesis carefully and logically worked out after years of careful thought and study. A partial exposition of the studies now presented *in extenso* was incorporated in a work previously published by the author, entitled *Dissolution and Evolution and the Science of Medicine.* The few who are familiar with the former work and who appreciate the value and importance of its generalizations will receive the present book with the greatest pleasure.

The author presents in this book, in separate chapters, "An Outline of a New Hypothesis of the Origin and Nature of Tumors;" "The Facts of Morphology;" "The General and Special Conditions of Tumor Disease;" "The Secondary Phenomena;" "The Evidence from Treatment and Heredity;" and finally "The Practical Deductions as to Prevention and Treatment." The condition of our knowledge of tumor disease in all its aspects (nature, causation and treatment) could scarcely be more unsatisfactory than it is, and scientific research in this direction is much to be desired.

It is useless, in a short review, to attempt to convey any conception of the nature of the hypothesis presented or the grounds upon which it is based; this can only be gained from a careful study of the author's presentation. It may be said, however, that it is quite worthy of careful study. The entire work is thoroughly scientific in character, and whether the conclusions of the writer are accepted or not, it cannot fail to be of the greatest interest to all who feel the need of new and broader generalizations in medicine and who appreciate any attempts to give coherence to the essentials of general and special pathological anatomy.

One criticism may be made as to the manner of expression, namely, that it partakes too much of the form affected by philosophic writers to be readily or easily grasped by the average physician. H. M. B.

THE TREATMENT OF SYPHILIS OF THE NERVOUS SYSTEM. By JULIUS ALTHAUS, M.D., M.R.C.P. (Lond.), Senior Physician to the Hospital for Epilepsy and Paralysis. London: Longmans, Green & Co., 1890.

ALTHAUS recommends that the treatment of nerve-syphilis should be first prophylactic, and second, curative. The prophylactic treatment should be pursued on two different lines. The first and most important of these is the destruction of the virus at the onset of the disease, both by excision of the primary sore whenever practicable, and by the *efficient* administration of mercury in the earlier stages before the disease encroaches upon important organs. He holds, with Henry Lee, Fournier, and others, that mercury efficiently administered in the earlier stages of syphilis acts as a true germicide, leaving the patient's constitution as uninjured as if the disease had never been contracted. On this point he quotes Mr. Lee, who states that: "If by being cured is meant that patients after proper treatment remain in future free from symptoms, do not infect their wives, have healthy families, and live as long as others, then I firmly maintain that syphilis is as curable as any other disease." This quotation, which expresses the view generally held by syphilographers, is evidently taken from Lee's protest to the view of Gowers, advanced in the latter's most interesting Lettsomian Lectures (January, 1889) on *Syphilis and the Nervous System*, that syphilis is incurable in the sense that the essential element of the disease, the virus that lies behind all the symptoms and consequences, may be totally destroyed by any treatment so that it can never again disturb the system.

The second point in the prophylactic treatment of nerve-syphilis is to sustain the nervous system of those who have had syphilis, and especially of those in whom the earliest phases of the disease escaped treatment. This Althaus does by advising, after a proper mercurial course, a prolonged holiday spent in the open air, especially at sea, and with it careful living in every particular. The curative treatment of nerve-syphilis resolves itself into the treatment of the specific lesion itself (gumma or endarteritis), and of its secondary consequences resulting from pressure or from removal of blood supply. Althaus regards mercury as a true specific in all primary nerve lesions, and believes that it cannot be replaced by any other drug, excepting, of course, potassium iodide when it is necessary to rapidly combat dangerous symptoms. The reviewer holds a similar opinion. To his mind the superiority of mercury over potassium iodide in the treatment of nerve-syphilis is due to the fact that the majority of cases of nerve-syphilis have not been subjected to a proper mercurial course before the nervous system becomes involved.

Althaus does not favor the intermittent plan of treatment. He is not in agreement with those who believe that mercury is apt to lose its effect after having been continued for a certain length of time. Experience, indeed, has taught him the reverse, that its effects are likely to be more decided rather than less when the system is kept constantly, though slightly, under its influence for many months. He prefers the hypodermic injection of a non-irritant, insoluble preparation of mercury to all other methods of introducing the metal, and the results obtained with it justify his preference. His preparation consists of metallic mercury, thoroughly triturated with lanolin and afterward well mixed with carbolized oil. This, prepared as he directs, forms a somewhat fluid, gray cream, in which all the metallic globules are extinguished. Five minims should equal half a grain of metallic mercury. He rarely finds it necessary to exceed this quantity, which he injects once weekly into the glutei muscles. He states that its injection is painless, and causes neither nodules nor abscess. We are surprised to encounter the astonishing statement that when the effects of mercury so used appear tardily, Althaus prefers giving sodium or potassium iodide coincidently, *to retain the mercury longer in the system*, rather than injecting larger doses of mercury. The effect of the iodide would be to form a soluble salt of its base and mercury, which, while producing a more prompt action, would of course be far more easily eliminated. On another page a similar statement appears, that a portion of the benefit resulting from a concurrent administration of potassium iodide is due to the iodide impeding the elimination of mercury!

Althaus regards galvanism as the most useful agent in the treatment of the secondary, ordinary lesions. It seems to improve the circulation in the affected vessels and promotes nutrition in the damaged area.

The reviewer has thus given an outline of this most excellent pamphlet; the paper itself is worth a careful reading. D. D. S.

DISEASES OF THE EYE. By EDWARD NETTLESHIP, F.R.C.S., Ophthalmic Surgeon to St. Thomas's Hospital; Surgeon to the Royal London Opthalmic Hospital (Moorfields), etc. Fourth American, from the fifth English edition. With a chapter on Examination for Color Perception. By WILLIAM THOMSON, M.D.. Professor of Ophthalmology in the Jefferson Medical College of Philadelphia. Philadelphia: Lea Brothers & Co., 1890.

THE popularity that Nettleship's work has achieved fully supports the good things that the reviewers have said of former editions, and leaves but few who require to be introduced to its merits. The changes from the matter of the last edition are comparatively slight, as might be expected from the slight advance that ophthalmic science has made in the brief period that has elapsed since the appearance of that edition. There have been some new cuts substituted for old ones, and a most notable improvement in the colored plate given to show the colors of the test and confusion skeins of Holmgren's test for color-blindness. Some change of attitude is apparent toward iridectomy in cataract extraction, but the after-treatment is still made to include the "partly-dark" room and the bandage.

The appendix giving formulæ, descriptions of instruments, etc., continues to be a valuable portion of the work. But, probably through an oversight of the publishers, it is rather overloaded with the name of a firm of opticians; and one, too, that has incurred the just disfavor of the medical profession. To refer to this firm as one from which Snellen test-types, and other such articles in universal use, may be obtained, and to repeat their name and full business address three times in a dozen consecutive lines, is certainly unnecessary for instruction of the reader.

E. J.

THE BIOGRAPHY OF EPHRAIM McDOWELL, M.D., "THE FATHER OF OVARIOTOMY." By his Granddaughter, MARY YOUNG RIDENBAUGH. Pp. xvi., 558. New York: Charles L. Webster & Co., 1890.

THE American reader will open this volume with no little interest, since it promises to give him a deeper insight into the life of one who stamped the impress of his genius upon medicine for all time. McDowell is one of the heroic figures in which the history of our profession abounds, and the authoress has placed us under no common obligation in writing his biography.

Every work of this character contains more or less irrelevant matter which could be omitted with advantage. The first hundred pages really include all the biographical portion, and will be of special interest to the profession, who are already sufficiently familiar with the history of ovariotomy and the opinions of eminent specialists, living and dead. Mrs. Ridenbaugh has executed her own part of the work very creditably, since she has given us a graphic picture of the private life of the great surgeon, the motives which governed him, and the almost superhuman courage which led him to attempt seeming impossibilities. Chapter V., containing an account of the historic first case of ovariotomy, is somewhat tantalizing, by reason of its extreme brevity. The professional reader will be disappointed at not finding a more detailed description of the operator's *technique*, but, from McDowell's remarkable modesty and aversion to publishing the results of his work, we are left in ignorance with regard to just those facts which would have been of greatest interest. We are told (on page 78) that "upon three different occasions he crossed the Atlantic Ocean to do the Cæsarean section," but that "he never made report of these performances, and the members of his family were the only persons that knew the object of his missions abroad." Considering what a formidable undertaking an ocean voyage was at this time, this is an astounding statement, which should have been carefully verified, especially as there is no record of it elsewhere. How unfortunate that so much of the work of this remarkable surgeon should be unknown, when that of lesser men fills volumes! That work seems more comprehensible to us when we study his character, a character which was cast in heroic mould and must serve as an inspiration to all.

In the latter three-fourths of this volume we do not feel the same absorbing interest as in the strictly biographical portion. Much time and labor have been bestowed upon the collection of various facts and individual opinions bearing upon the subject of ovariotomy—which are, however, not without historic value.

The style of the authoress is somewhat florid, but is clear and pleasing. The typography and binding of the volume are among the best examples of the printer's art, so that it is almost an *edition de luxe*. H. C. C.

QUIZ COMPEND ON ANATOMY. By S. O. L. POTTER, M.D. Philadelphia: P. Blakiston, Son & Co., 1890.

THE fifth edition of this *Compend on Anatomy* is before us, and is practically the last edition, with tablets and plates of the arteries and nerves (spinal and sympathetic) in outline, with the name either on or near the artery or nerve, added as an appendix. The tablets are systematically arranged and concisely worded, making the compend alike suitable for first-course as well as for advanced students. As the work now stands, it is well fitted for a general review of anatomy, but not suitable to be used by students to dissect from, which function it is very frequently supposed to perform by first-course students, on account of its numerous illustrations. It should not be used as a substitute for a text-book on anatomy, as has been done. A. H.

THE PROGRESS OF MEDICAL SCIENCE.

THERAPEUTICS.

UNDER THE CHARGE OF

FRANCIS H. WILLIAMS, M.D.,

ASSISTANT PROFESSOR OF THERAPEUTICS IN HARVARD UNIVERSITY.

EFFECTS OF COCAINE.

DR. EDWARD FALK, of Berlin, has made a study of the effects and dangers of cocaine which has a very practical interest for all medical men, as it is so universally used. There is hardly a substance about which there are so many opinions as about this drug, especially in regard to what is the safe amount to use under the various conditions which prevail in practice; at one time large amounts, up to fifteen grains, are well borne and cause no disturbance; in other cases a fraction of a grain may produce toxic symptoms. The character of the symptoms may also vary widely; it may cause excitement, or in other cases stupor; hallucinations may follow its use; it may induce coma; at times convulsions may be the result, at others paralysis.

Dr. Ehrich's opinion that cocaine as a local anæsthetic is one of the greatest discoveries of modern medicine, is in marked contrast to Dr. Erlenmeyer's verdict, that in its capabilities for harm it is second only to alcohol.

The number of those who have experienced the acute ill effects of cocaine is already large, but still greater is the number of those unfortunates who have become subjects of its habitual use.

Dr. Falk has collected the details of one hundred and seventy-six cases where serious symptoms were produced by the use of cocaine, and among them are ten fatal cases. His tables are too full to be given here.

The smallest dose of cocaine which produced toxic symptoms when taken by the *alimentary canal* was two-thirds to nearly one grain (one case). Death followed in one hour after eighteen grains in one case, and in another twenty-two grains caused death in twenty minutes. In one case very serious symptoms followed fifteen grains, though the result was not fatal.

From *local application* the amount which will cause poisoning varies with the part with which the drug is brought in contact.

The smallest dose which caused alarming symptoms when injected into the *bladder* was fifteen grains, though eighty grains did not cause as serious symptoms in another patient.

In the *urethra* the injection of fifteen drops of a 3 per cent. solution (⅓ grain) caused very threatening symptoms; in another case in which twelve grains were injected into the urethra death followed in twenty minutes. After application to the *uterus* of two grains in one case, and nearly three grains in another patient, toxic symptoms were caused. Applied to the *rectum*, death followed after the use of eighteen grains.

After the use of cocaine in the *nasal* cavity, serious poisoning followed only one-fifth of a grain.

In the *ear* five drops of a 5 per cent. solution (⅕ grain) caused marked symptoms.

In the *mouth* and *throat* half a grain, three drops, of a 20 per cent. solution in a tooth proved sufficient to cause unconsciousness. One-twelfth of a grain under the gum was followed by opisthotonus and irregular breathing.

Brushing the *pharynx* with a 4 per cent. solution was sufficient to cause poisoning in several cases.

Surprisingly small amounts caused symptoms from absorption through the *conjunctiva*, one-sixteenth of a grain (two drops of a 4 per cent. solution), and in a boy of fourteen one-tenth of a grain, or one drop of a 1 per cent. solution. (Cyanosis of the lips, paleness, profuse sweating, slow, small pulse.) Two-thirds of a grain injected under the conjunctiva in a woman seventy-one years old was followed by death in five hours.

As regards the use of the remedy *subcutaneously*, the variation in the effects with the site of the injection is not so obvious as when applications to the various membranes are made. The observations made by Wölfler, in 1889, showed, out of 23 cases of poisoning by cocaine, 19 were about the head, 1 in the larynx, and the remaining 3 were not considered, as an excessive quantity (over two-thirds of a grain) had been used. From the cases reported by Dr. Falk, however, injections about the head are not so much more dangerous than into other parts. He found 28 cases where these injections were made into the trunk, 9 into the extremities, and 7 into the head. If to these last we add 36 cases where the injections were made into the gums and 5 cases where the injections were made into the conjunctiva, we have a total of 48 injections into the head, to contrast with 37 cases where the injections were not made into that part. The amount injected into the trunk and extremities was not excessive—that is, three grains were exceeded only five times—and in injections about the head this quantity or more was given six times. The smallest amount which caused symptoms in each case was two-thirds of a grain into the trunk, one-sixteenth of a grain into the forearm, and rather more than two-thirds of a grain into the head.

From the cases here collected it would seem that we are not justified in considering that the site of the subcutaneous injection affects the possible toxic results.

The local use of cocaine varies in its effects with the rapidity of absorption of the membrane to which it is applied. The conjunctiva is a very rapid channel, after that the order would be nose, larynx, mouth, and ear, in which group up to one-third of a grain in general may be used; then come the urethra, uterus, and rectum, for which a maximum dose is one and a half to two grains.

For the intact bladder fifteen grains may be injected without danger.

Old women who are poorly nourished, and youthful patients who are nervous and anæmic, are especially susceptible to the action of cocaine.

The local use of cocaine in the eye sometimes causes a cocaine conjunctivitis, characterized by acute swelling and redness of the skin of the eyelids.

To avoid the toxic symptoms it is advisable, with anæmic patients, to have them lie down and breathe a few drops of nitrite of amyl.

Disease of the heart and bloodvessels, especially atheromatous processes and fatty degeneration of the heart and pernicious anæmia, are contra-indications.

The treatment should be warm drinks, sinapisms over heart and stomach, in case of marked vasomotor stimulation, inhalation of amyl nitrite; for convulsions, chloral hydrate, chloroform and opium; if breathing fails, artificial respiration.—*Therapeutische Monatshefte*, Nos. 10 and 11, 1890.

PHYSIOLOGICAL ACTION OF THE CONSTITUENTS OF THE ARTIFICIAL SALICYLIC ACID OF COMMERCE.

PROFESSOR DUNSTAN and MR. BLOCH, with PROFESSOR CHARTERIS, of the University of Glasgow, have made a careful investigation into the constituents of artificial salicylic acid and their physiological action.

In 1886 it was discovered that the administration of the artificial salicylic acid made from carbolic acid, however much it may have been dialyzed and purified, rapidly produced results resembling delirium tremens; and since then many reports of bad symptoms following its use have been published in the medical journals, so that it is now generally admitted that the artificial salicylic acid and its salt of sodium are dangerous to animal life, while natural salicylic acid and its salt of sodium are not. Further, it has been shown that the difference is attributable to an impurity in the artificial acid, not a trace of which exists in the natural salicylic acid. The character of the impurities in the artificial salicylic acid, or the nature of the toxic principles contained within it, were not recognized, however, until they were separated by Professor Dunstan. He has separated from the artificial salicylic acid three acids, which he recognizes as meta-creasotic acid, ortho-creasotic acid, and para-creasotic acid.

The physiological action of these acids was tested by Dr. Charteris, who found that the ortho- and para-creasotic acids are slow but certain poisons, causing prostration and paralysis, affecting first the hind legs, and extending gradually over the body. The lethal dose for the rabbit is about one grain per pound of body weight. The meta-creasotic acid was found to be innocuous.

As the melting-point of artificial salicylic acid is 157° C., the conclusion from these experiments seems to be that the high melting-point is not the only or the best test for purity, but a stronger test is required, and this is, that the artificial crystals should be identical with those of the natural variety, for crystallization seems to be absolutely essential to secure a uniform and harm less physiological action.

The authors further conclude that if salicylic acid be prepared from synthetic carbolic acid, having a melting-point of 42° C., it then contains no impurity; but this pure carbolic acid is about three times the price of the ordinary form used, so that until this can be purchased at a cheaper rate, a more economical plan is to produce salicylic acid from ordinary carbolic acid, and subsequently to purify it. A pure salicylic acid should have a melting point of 157° C., and should occur in the form of white, separate, prismatic crystals—inodorous, tasting at first sweetish, then acid; soluble in about five hundred parts of cold water and fifteen of boiling water; readily soluble in hot chloroform; soluble in chloroform and ether. Melting-point about 157° C. Dose, ten to thirty grains.

The purified salicylate of sodium should be made by the action of the purified salicylic acid on carbonate of sodium, and should occur in the form of well-defined, white, odorless crystalline scales, having a sweetish saline taste; soluble in nine-tenths part of its weight in water, or in six parts of rectified spirit. Dose, ten to thirty grains.

There can be no doubt but that much of the disrepute which has attended the administration of salicylic acid and its salts in rheumatism has been attributable to impurities resulting from the employment of the unpurified artificial acid; and it would seem from the results of Dr. Charteris that if the pure acid only be employed, its administration might be pushed to the full extent without risk, and that we may almost conclude that we have in it an absolutely reliable, safe, and almost specific cure for rheumatism and rheumatic affections. More than this, the use of salicylic acid is not confined to medicine, but has been largely used the world over for the preservation of food substances. If, therefore, it be true that commercial salicylic acid is poisonous, and the cause of its toxicity has been discovered, the importance of these facts cannot be overestimated. It is true that in France we find the use of salicylic acid for food preservation condemned as illegal, but there is no doubt that it is largely so employed. Moreover, it appears that the greater part of the salicylic acid sold in Europe is made in Germany, and the manufacturers there practically admit that they are selling an impure article; for they place on the market what they term a crystalline acid for twelve cents a pound more than the commercial article, and an article which they term a pure acid at seventy-five cents per pound more than the former. It is, therefore, almost self-evident that the cheaper article, which is used for commercial purposes, is artificial salicylic acid contaminated with para-creasotic acid. It has been stated that, in Germany especially, the beer, which is used so freely there, contains a considerable quantity of artificial salicylic acid, which, if true, would, without doubt, charge the salicylic acid with the intoxication which may follow its employment, rather than the small amount of alcohol contained in it.—*Therapeutic Gazette*, No. 1, 1891.

Chlorate of Potassium Poisoning.

Dr. Landerer, assistant in the medical clinic of Prof. Leube, Würzburg, reports a fatal case of poisoning in a young man eighteen years old, after taking an ounce of chlorate of potassium. It was intended to be used as a gargle, but he dissolved the salt in a glass of warm water, and drank the whole of it in two portions within half an hour.

The first symptoms, which came on shortly after the ingestion of the drug, were weakness, thirst, and dizziness; the more serious symptoms, the result of the action of the salt upon the blood, were acute anæmia, dyspnœa, cyanosis, continued vomiting, pain in the hypochondrium and near the umbilicus, icterus; liver and spleen both enlarged.

The amount of urine was very small, three and a quarter ounces in seven days, and contained little or no chlorate of potassium. It contained much albumin and sediment. The patient died on the sixth day, without convulsions or other uræmic symptoms.

The autopsy, made by Prof. Rindfleisch, gave the following: Œdema et hypostasis pulmonum, nephritis acuta cum infarctu hæmoglobinurico ex intoxicatione kali chlorici. Gastritis acuta, erosiones ventriculi. Enteritis et colitis acuta follicularis cum erosionibus in jejuno.

The case was under observation from the beginning, and was studied carefully, and the author gives much detail at length, besides some discussion of the observations of others. His conclusion is that chlorate of potassium should be excluded from our list of remedies, and certainly never used for children. —*Deutsches Archiv f. klinische Medicin.*

PERMANGANATE OF POTASSIUM AS AN APPLICATION TO THE BITES OF POISONOUS INSECTS.

DR. S. F. DUPON, of Fort Havach, Ga., writes that he has used permanganate of potassium with striking success as an antidote to the venom of poisonous insects and fish. A solution in glycerin (ʒij–℥i) is applied externally, and has given speedy and positive results in his hands. Saleratus is also useful in similar cases, and he recommends its use when the permanganate is not at hand. It should be made up into a paste with water, and applied to the bitten part.—*Medical Record*, No. 1, 1891.

GUAIAC AS A LAXATIVE.

DR. MURRELL (*Medical Press and Circular*) thinks that guaiac is a valuable laxative. His attention was drawn to the subject, two years ago, by casually prescribing guaiac lozenges made up with black-currant paste for a man suffering from rheumatism. This patient continued taking the lozenges long after the pain had ceased, and in explanation said that they did him good by acting on the liver and bowels, and that one or two of the lozenges, taken in the morning before breakfast, produced a stool promptly and without inconvenience. The author ordered the lozenges for others of his patients suffering from constipation, and what is conventionally called "biliousness," and the results were equally satisfactory. The lozenges not being available for hospital use, he had a confection prepared containing ten grains of guaiac resin to one drachm of honey. This, for the last two years, he has used extensively, not only as a purgative, but in the treatment of chronic rheumatism, sciatica, tonsillitis, dysmenorrhœa, and allied affections. The dose may be one to three drachms daily. The purgative effect is very pronounced, and in one case the patient had fifty-six evacuations in one week. In another case, it produced a well-marked rash, covering the arms and legs with an eruption which forcibly reminded one of a copaiba rash. It was accompanied by intense itching, which disappeared on discontinuing the drug. The guaiac not infrequently gives rise to a burning sensation in the throat, and to obviate this he prescribes ten grains of the resin in half an ounce of extract of malt. He believes that a trial of guaiac, either as a laxative or purgative, according to the dose employed, will be found satisfactory. It is possible that if the drug were triturated with cream of tartar, or with some inert substance, such as sugar of milk, its efficacy would be increased, and that it would produce the desired effect in smaller doses.—*Medical Progress*, No. 24, 1890.

Treatment of Obstruction of the Bowels by Large Doses of Olive Oil.

Dr. E. W. Mitchell, of Cincinnati, reports two cases of successful treatment of obstruction by means of olive oil, this method of treatment being the result of a suggestion of Prof. Langdon. One of the patients, a man fifty-three years old, had had an operation for strangulated inguinal hernia on the left side, twenty months previously. When seen for his present trouble he had not been well for a day, there had been severe colicky pains and vomiting after each attempt to take food. Enemata were given on this and the following day with little result. Morphine was given, and large enemata through a rectal tube, introduced as far as possible, produced no effect. Almost two quarts of dirty fluid was withdrawn through a stomach tube. Two ounces of sweet oil were ordered to be taken every hour. Tympanites during the afternoon and early evening had rapidly increased. There was much prostration, no nourishment having been retained. During the night, half a pint of oil was taken. In the morning there was less prostration; there had been a small fluid passage. An enema, now administered through a rectal tube (English gum catheter, No. 16) returned slightly discolored, and containing a trace of oil. There was a recurrence of vomiting, but the oil was continued. About noon the bowels began to move, and several fluid stools were passed during the following night. On the next day the stools became formed and contained pus in small quantities. The case was probably one of fæcal impaction—there were no evidences of typhlitis or perityphlitis.

The second case was that of a young man twenty-two years old. The bowels had not moved for forty-eight hours, and he had been suffering from tormina and vomiting. Large doses of cathartics had already been taken. Thorough examination failed to find any evidence as to the point of obstruction; the hernial openings were clear, there was no point of tenderness, no tumor, the abdomen was quite tympanitic. He was treated by sulphate of magnesia, repeated clysters through a rectal tube introduced as far as possible into the bowel, and sufficient morphine to control extreme pain. This treatment was continued for two days with no benefit, the tympanites increasing, vomiting becoming stercoraceous, and the patient much prostrated. The administration of sweet oil was then begun; a pint was taken within a few hours, most of which was retained, although he had before been vomiting everything. Three hours after beginning the oil the bowels began to move, and a good recovery ensued.

Dr. Langdon mentions in the same journal eight cases where relief had been obtained from large doses of olive oil.—*Cincinnati Lancet-Clinic*, No. 3, 1891.

MEDICINE.

UNDER THE CHARGE OF

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CARDIAC NERVE-STORMS; ESSENTIAL TACHYCARDIA.

In a paper read before the Philadelphia Neurological Society, WOOD (*University Medical Magazine*, March, 1891) discusses the subject of cardiac nerve-storms, with especial reference to essential tachycardia. "Nerve-storm" is a convenient clinical designation for a sudden, violent, temporary disturbance of the nervous system, either sensory or motor. The attacks of migraine, of angina pectoris, and the crises of locomotor ataxia, are examples of sensory nerve-storms; the paroxysms of epilepsy and of tachycardia, examples of motor nerve-storms. Tachycardia, or excessive rapidity of cardiac action, may result—(1) from paralysis of the pneumogastric nerve, (2) from reflex influences, or (3) as a part of a neurosis. Such a condition, however, is not a true nerve-storm. To distinguish the latter from the former the name paroxysmal tachycardia is given to the true cardiac motor nerve-storms, with the qualification "essential" when no etiological or exciting moment can be recognized. The condition shows no tendency to shorten life or to develop organic disease, and is compatible with great mental and physical activity. The paroxysms recur at varying intervals, are unattended with pronounced pain or excessive distress, and may sometimes be arrested by the injection of cold or hot fluids, by a deep inspiration, or by other procedures which stimulate the cardiac inhibitory centre. There is a curious parallelism between the tachycardiac nerve-storm and the epileptiform convulsion. Wood believes the mechanism of tachycardia to be dependent upon a discharging lesion affecting the centres of the cardiac accelerator nerve.

PULMONARY SYPHILIS.

LANCEREAUX (*L'Union Médicale*, January 29 and 31, 1891) has presented an able contribution to the subject of pulmonary syphilis. The condition is relatively infrequent. Its study is difficult because the lesions so closely resemble those of tuberculosis. The pulmonary complications of syphilis belong especially to the third stage, and appear in two forms: as a diffuse sclerosis, the less common, and as circumscribed gummata. In addition, there is always fibroid thickening of the related pleura. The changes are usually confined to the lower lobes. More rarely they appear at the base of the upper lobe, and only exceptionally at the apex. With them may be associated syphilitic lesions of the air-passages, of the mouth, of the testicles, or even of the brain. The fibrosis of the lung is not homogeneous in its distribution, but appears in dense bands following the lines of lymphatics or radiating from a bronchus or bloodvessel. The intervening tissue is indurated or emphysematous, but not pigmented. The bronchi are compressed and the alveoli filled with leucocytes and desquamated cells. The bronchi may ultimately undergo dilatation. Of gummata, there are rarely more than eight or ten present in a lung. They vary in size from a pea to a large nut, and consist of a central and peripheral zone. The former is made up of disorganized elements, hyaline and slightly granular, surrounding a bloodvessel, which may be recognized by its elastic membrane and some blood corpuscles within its contracted lumen. The peripheral zone is made up of small, round cells, resembling the elements of embryonal connective-tissue, and of a large number of fusiform cells and vessels, of which the walls are thick but the lumen free. The process is thus a peri-arteritis, extending eccentrically, ultimately invading also the other tissues of the vessel and narrowing its lumen, as a consequence of which the centre of the gumma becomes granular and fatty. This central portion may become dry and undergo absorption with subsequent cicatrization, or it may undergo softening and ulcerate into an adjacent bronchial tube. The condition is to be distinguished from the condensation of tuberculosis, of lepra, and of impaludism. When the process in the lungs is tuberculosis it is usually seated at the apex, attended with caverns and infiltration in the neighborhood, with miliary granulations, having peculiar histological and bacteriological characters. If the pulmonary fibrosis is leprous there are other external evidences of lepra, and it may be possible to find the bacillus of lepra in the sputum. The fibrosis of impaludism is compact and uniform, and has a marbled appearance, with a bright, glistening section. The lung is enlarged.

The existence of the disease may escape most careful observation. There may be slight impairment of the percussion resonance, with increased resistance, over irregular areas at the lower half of the chest, feebleness of vesicular murmur, perhaps râles, and rarely a friction-sound. Cough, at first dry, may become moist, with muco-purulent expectoration and possibly hæmoptysis. Dyspnœa and oppression may also be present. Fever is absent, unless there be ulceration or suppuration. The face is pale, but not cachectic. Emaciation is not decided unless the liver and spleen are also involved.

The diagnosis is extremely difficult. It depends upon the localization of the lesions in the lower half of the lung, the recognition of lesions in other parts of the body or a history of syphilis, the absence of fever, of emaciation, of tubercle bacilli in the sputum. The treatment does not differ from that of syphilis under other conditions.

THE PHENYL-HYDRAZIN TEST FOR SUGAR.

HAVILBURG (*Centralbl. für klin. Medicin*, January 31, 1891), of Rio de Janeiro, proposes a modification of the Fischer-Jaksch test for the presence of sugar in the urine, which he considers more reliable. Two parts of phenylhydrazin hydrochlorate and three of sodium acetate are added to half a test-tubeful of water, to which a like quantity of urine to be tested is added. Instead of boiling over a water-bath the mixture is shaken with chloroform. In a little time the fluids separate. If sugar be present canary-yellow crystals appear in the upper layer. The reaction is more striking if the fluid is boiled and permitted to cool before the addition of chloroform. Havilburg suggests that the procedure might be adapted for use as a ready means of quantitative determination of the amount of sugar present.

SERUM OF DOGS' BLOOD IN THE TREATMENT OF TUBERCULOSIS.

Having observed that subcutaneous injections of cultures of the staphylococcus pyosepticus caused death in rabbits, while dogs escaped, RICHET (*L'Union Médicale*, January 31, 1891) found that transfusion of dogs' blood into the peritoneal cavity of rabbits conferred upon the latter immunity against the staphylococcus pyosepticus. Reasoning in the same line, Richet conceived that injections of the blood of an animal refractory to tuberculosis into a susceptible animal would confer upon the latter immunity against tuberculosis. Ten rabbits were given intra-peritoneal injections of dogs' blood, followed by injections of cultures of the bacillus tuberculosis, and ten others, for control, received the latter without the former. At the end of three months the rabbits of the first series had gained weight and become plump, while of those of the second some were dead of tuberculosis and others were emaciated. At the end of six months, however, the surviving rabbits of both series were all tuberculous and in the same apparent condition. The conclusion is, that intra-peritoneal injections of dogs' blood in rabbits retards but does not prevent the development of tuberculosis. But one injection was made in each instance, which if repeated might indefinitely retard the development of the disease. It was now proposed to apply the method, modified, to man. The serum of dogs' blood was separated and injected under the skin. To obtain the serum, the carotid artery of a dog is exposed, a ligature placed above, a forceps below the point at which the vessel is to be cut, a sterilized glass canula introduced into the proximal end of the vessel and connected by a rubber tube with a Pasteur bulb. The forceps is removed, one bulb filled, closed with a plug of cotton, and another filled, and so on. The bulbs are put aside for twenty-four hours. Corpuscles and fibrin gravitate to the bottom. The serum floats on top. So as not to be obliged to kill a dog for each injection or to sacrifice a bulb, Richet has had made smaller bulbs, each with a capacity for sufficient fluid for one or two injections. These are oval, elongated, and terminate at each extremity in a fine tube. To fill one it is plunged by one extremity into the serum which is aspirated at the other. For preservation, the extremities are sealed in the flame of a lamp. To be sure that the fluid is sterile it is placed for forty-eight hours in a steam chamber. If, at the end of this time it is still limpid, it is kept, but if turbid it is thrown away. When it is desired to use the serum the ends of the bulb are broken and one or two cubic centimetres (fifteen to thirty minims) taken up into a syringe. The injections were made in some fifty cases during six weeks by Langlois, Héricourt, and Saint-Hilaire. The results obtained have been encouraging. The injections have been unattended with accident, local or general, with fever, or with syncope. They are entirely inoffensive. Without theorizing as to the mode of action of the serum of dogs' blood, Richet believes that it contains substances chemically antagonistic to the development of the bacillus tuberculosis.

Aortic Aneurism Communicating with the Superior Vena Cava.

Ord (*British Medical Journal*, February 21, 1891) presented to the Pathological Society of London a specimen taken from a man of forty-three, without a history of alcoholism or syphilis. Six months before death the patient had perceived a sensation of pricking in the right side of the chest, with dysphagia and inability to lie on the left side. The face and ears became livid, the right side of the neck and chest œdematous, with turgid, superficial veins. There was no visible tumor of the chest, but the percussion-note was dull from the right border of the sternum outward, between the upper borders of the second and fourth ribs, over which area there was pulsation but no thrill. Auscultation revealed a long, continuous humming murmur of varying intensity, more sonorous during the cardiac systole, fainter during diastole, conducted into the neck and heard over the entire posterior aspect of the right chest. The area of cardiac dulness was increased, and there was an apical, musical, systolic murmur distinct from the continuous murmur. The radial pulses were equal, the arteries thickened. There was neither ascites nor anasarca. There were at first signs of improvement, but subsequently the facial œdema and the dyspnœa increased and death occurred rather suddenly. At the autopsy the right pleural cavity contained about eight pints of blood, which was found to have come by a small opening from an aneurism about the size of an orange, situated two inches above the valves of the aorta. The cavity of the sac of the aneurism, which contained only a little pale, adherent clot, communicated by a slit about half an inch long, with the superior vena cava two inches below the union of the innominate veins. The first part of the aorta also was unhealthy. In the discussion it was brought out that murmurs simulating that described are occasionally heard over vascular sarcomata within the thorax and elsewhere.

Idioglossia.

Dr. Hale White and Mr. Golding Bird brought forward (Royal Medical and Chirurgical Society, March) two boys, brothers, thought by their parents to be suffering from deaf-mutism. This was not so; they heard well and expressed themselves in articulate sounds. These sounds were unlike those of any known language, but the same sound was always used by the same child to express the same word. Each child had thus a language of its own, and the authors have (at the suggestion of Dr. Perry) named the condition "idioglossia." The elder sister of these boys was slightly affected. All the children were remarkably intelligent, and could read any book and understand what they read, and wrote English correctly. There was no observable physical defect. One of them was left-handed. There were traces of insanity in the family. The treatment adopted had been careful oral training.

After referring to several points of interest in connection with these cases, the authors discussed the nature, origin, and treatment of the affection, and referred to several other recorded cases.

Dr. Frederick Taylor reported a similar case. The boy was aged eight and a half years, and had no physical defect beyond very slight arching of the palate. He had never talked properly, and when he first came under observation was almost unintelligible. He, however, understood what was said to him, could read short words, and could write in a child's round hand. When first seen his pronunciation of many consonants, especially p, t, k, s, was defective, and he added the syllables "ida," "eda," to nearly every word that he spoke. He had been submitted to a modified oral instruction, and was after some months much better.

His pronunciation of the Lord's Prayer on December 20th and February 3d was as follows:

	Our	*Father*	*which*	*art*	*in*	*heaven,*
Dec. 20th.—	Ouarda	farada	id	arda	a	haida
Feb. 3d. —	Ouer	faerda	we	ad	a	evven
	Hallowed	*be*	*Thy*	*name.*		
Dec. 20th.—	Howarda	beda	adarda	dene		
Feb. 3d. —	Alloeda	be	Thy	name.		

The author regarded the case as mainly one of defect of articulation, the centres for which might be regarded as less apt for education than those of average individuals.

Dr. Pye-Smith agreed with Dr. Taylor that the term "idioglossia" was not the best one to express the condition, which was not a language but an imperfect form of English, or rather English imperfectly pronounced. He noticed that with labials and gutturals differences well known to philologists were found, as "d" for "l," "g" for "y," etc. The prefixing of vowels was, he said, curious, and compared the French work "espèce" with the Latin "species." The addition of terminals also was well known. They seemed to him to be extreme cases of what was called in America "baby language," complicated, perhaps, in some of the cases by some physical defect, as nasal obstruction.

Dr. Hadden referred to two cases of a similar nature published by him in the *Journal of Mental Science*. He suggested that the best treatment was by isolation. His first case was left-handed, and his father had died in an asylum. He agreed with the previous speakers that the term "idioglossia" was not a satisfactory one.

Mr. Spencer Watson thought that the cases under discussion might belong to the class of deaf-mutes, and that there might be errors of hearing comparable to errors of refraction, and that the condition could be removed by education. The defects could be attributed partly to defective hearing, partly to imitation, and partly to adenoid growths in the posterior nares. It was not necessary to assume any central nervous defect.

DR. WILKS thought it was a question of speech rather than of language.

DR. HALE WHITE, in reply, defended the term idioglossia. He regretted that nobody had been able to associate the condition with the left-handedness that was present in so many of the cases. In his cases there had been no physical defect except possibly some nasal obstruction in one case.

THE SO-CALLED PARASITIC BODIES IN EPITHELIOMA.

In connection with what has appeared in the journals of late with reference to the parasitic nature of epitheliomata, the observations of WELCH (*Johns Hopk. Hosp. Bull.*, 1890, 97) are of great interest. He has found specimens of carcinomata whose cells contained bodies which very closely resembled in appearance and behavior with coloring reagents many of those which have have spoken of as microörganisms. He describes some of the bodies of different shapes and different characteristics which he has observed, and says that while their nature cannot always be satisfactorily determined, it is entirely premature and unwarranted, on any evidence yet brought forward, to regard them as sporozoa or other forms of parasites. Many of these bodies, so far as flat-celled epithelioma are concerned, can be explained: 1. As masses of keratin, a part of the protoplasm having undergone in a circumscribed area the keratine metamorphosis, while the rest remains granular. 2. As irregular masses of eleidin or kerato-hyaline. 3. As included leucocytes undergoing degenerative changes, with or without fragmentation of nuclei. 4. As scattered nuclear fragments derived from the preceding. Just as epithelioma is essentially a typical growth of epithelium, so it is not surprising to find various typical metamorphoses of the epithelial cells in it.

PULSUS BIGEMINUS COMPLICATED BY A QUADRUPLE AORTIC MURMUR.

J. WALLACE ANDERSON (*Glasgow Medical Journal*, February, 1891) has reported the case of an adult, with a history of three attacks of rheumatism, who presented the signs of aortic obstruction and regurgitation. While under observation, during paroxysms of epigastric distress associated with digestive derangement, there was heard what is described as one long murmur distinctly broken up into four component parts. The first was most marked, the last next in intensity and most prolonged, while the intermediate two appeared to be equally faint, soft and short. The radial pulse was bigeminous, a weaker impulse following quickly each primary beat, succeeded in turn by a longer interval and a repetition of the primary beat. While under treatment with salicylate of sodium for rheumatic pains, the patient suddenly died. An autopsy was not permitted.

The *pulsus bigeminus* has been described by Traube and by Hyde Salter. Guttmann asserts that it is almost exclusively associated with obstruction to the circulation, such as may be caused by valvular defects. Anderson, on the other hand, takes the position that the abnormality is a functional neurosis, dependent, in his particular case, upon derangement of innervation affecting the pneumogastric and sympathetic nerves, as it manifested itself after the appearance of symptoms of dyspepsia and vanished with their disappearance.

RESEARCHES ON THE EXTREMES OF TEMPERATURE BORNE BY THE LEUCOCYTES OF HUMAN BLOOD.

MAUREL (*Comptes rend. d. Soc. d. Biol.*, 1890, ii. 538) publishes some very interesting researches upon this subject. He describes the different forms of leucocytes found in the blood, as illustrating somewhat their life-history there. He then details the results of his experiments in subjecting blood to different degrees of temperature, watching meanwhile the effect upon the power of motion and upon the life of the white corpuscles. A degree of cold below 16° C. could only be borne by them for a short time, and 14° C. was immediately fatal. On the other hand, a temperature above 44° C. rapidly threatened their life, while one of 47° C., even for a few minutes, suffices to kill them.

From a clinical standpoint these experiments show that the greatest degree of activity of human leucocytes is witnessed at the temperature of the blood in a normal state, or during a febrile state of slight intensity. As is well known, the axillary temperature is about two degrees less than that of the blood in the interior of the body. It is evident, therefore, that in very high fever, with an axillary temperature of 41° C., or, exceptionally, of 42° C., a point is being approached at which the life of the leucocytes is seriously threatened.

A CASE OF MEDIASTINAL TUMOR.

At a meeting of the Glasgow Pathological and Clinical Society (*Glasgow Medical Journal*, February, 1891) GEMMELL reported the case of a laborer, aged sixty, with cough, expectoration, shortness of breath and a sense of suffocation. The urgent symptoms had existed for six weeks. The face was flushed and bloated, the lower eyelids œdematous. Pulse, temperature, and respiratory frequency presented nothing abnormal. Examination of the lungs revealed the signs of chronic bronchitis. There was no œdema of the lower extremities and no ascites. No lesion of the abdominal viscera was detected. The urine was non-albuminous. The progress of the case suggested the presence of an intra-thoracic tumor. A circumscribed area of dulness was detected in the region of the manubrium sterni. In this situation, the second sound of the heart was "highly musical and of deep-toned quality." There was a difference in the force and rhythm of the radial pulses, the left being weaker than the right and somewhat delayed. No abnormal pulsation was perceptible. No enlarged glands were found above the clavicle, to indicate the presence of malignant disease within the thorax. The position of the trachea was median. The veins of the neck were greatly distended. The face was congested, the lips livid. Respiration was accompanied by distinct stertor, inspiratory and expiratory. The voice was hoarse, the cough not brassy. The mucous membrane of the larynx participated in the œdema. The movements of the vocal bands were normal and, except for a slight linear injection, their general appearance was healthy. The trachea appeared not to be compressed. The patient did not complain of pain or of abnormal sensations. The obstruction to the venous circulation soon gave rise to serious cerebral disturbance, the patient became delirious, then comatose, and death ensued.

Post-mortem examination revealed a growth in the anterior and middle mediastinum, toward the right of the median line, projecting upward into the root of the neck. The mass completely surrounded the superior vena cava and seriously involved the other great venous trunks in the same region. There were nodular projections of the new tissue into the lumen of the superior cava. The growth had not involved the pericardium to any extent, and there was no pericarditis. The tumor was unusually limited and localized, and, although presenting to the naked eye all the features of a cancerous growth, it was found on microscopic examination to be a lympho-sarcoma.

In the discussion, McCall Anderson said that one of the chief points of interest in connection with this class of cases was the diagnosis. It was frequently one between tumor and aneurism. He believed that one distinguishing feature was pressure upon the veins. This was rarely observed in the case of aneurisms.

Hypertrophic Biliary Cirrhosis.

Ghosh (*Indian Medical Gazette*, January, 1891) read a paper before the Calcutta Medical Society on the distinction between biliary cirrhosis and other painless enlargements of the liver. This particular form of cirrhosis occurred in children under two and a half years of age, and almost invariably terminated fatally in from three to twelve months. It manifested itself by a painless enlargement of the liver, which was hard and resistent on palpation, in consequence of a hyperplasia of the interlobular connective-tissue. The organ, at first enlarged, became subsequently diminished in size, from secondary contraction. In some cases, the spleen was also enlarged. There was fever of a continued type, with evening exacerbations, ascites, jaundice, and death from cholæmia. The only etiological element proposed is faulty diet. The disease is becoming more frequent in India and is not seen in European children. It is to be diagnosticated from amyloid disease and enlargement of the liver due to malaria. It is distinguished from the former by the age at which it occurs, its etiology, its rapid and fatal progress, the absence of anæmia and cachexia, the common occurrence of jaundice, the absence of involvement of kidneys, stomach, and intestines, and the anatomical changes. The diagnosis from the enlarged liver of malaria is more difficult. The principal points of distinction, however, are—race; age; sex, males being affected with the biliary form in largest proportion; locality, biliary cirrhosis not being confined to malarious districts; type of fever; absence of cachexia; prognosis; duration and mortality; etiology; results of treatment.

Mercurial Stomatitis.

Fournier (*La Médecine Moderne*, January 15, 1891) discusses the causes and prophylaxis of the stomatitis resulting from the therapeutic administration of mercury. In giving mercury by the mouth, by inunction, by fumigation, or by subcutaneous injection, there is always risk of producing stomatitis. All preparations of mercury, however, are not equally active in this direction. The protiodide deserves the popularity in which it is held. From one-third to three-quarters of a grain daily is ordinarily well borne. Larger doses are apt to produce ptyalism and stomatitis. The bichloride in doses of one-seventh (!) of a grain, once, twice, or three times a day, is well tolerated. It does not salivate because it must be given in small doses so as not to be rejected by the stomach.

Inunctions are most likely to give rise to stomatitis. A drachm of mercurial ointment, well rubbed into the skin, occasions no unpleasant results. When stomatitis follows inunctions, its onset is sudden and its intensity marked.

In administering mercury by subcutaneous injection, stomatitis may be avoided by using minimal doses at intervals of two or three days.

Certain conditions favor the development of mercurial stomatitis. There may be an idiosyncrasy against mercury in any form, the smallest doses, however administered, causing ptyalism, or the appearance of a red rash. Pre-existing stomatitis, from whatever cause, invites an intensification from the use of mercury. The mere presence of the teeth seems to be sufficient to induce such a condition, as mercurial stomatitis is not seen in edentulous infants and old persons, or in those employed in mercurial mines who have already lost their teeth.

Females are more susceptible than males to the ptyalizing effects of mercury. Salivation also occurs with greater readiness when inunction is practised upon a delicate surface, as the skin of the scrotum, or where an abrasion exists or the epidermis has been removed.

SURGERY.

UNDER THE CHARGE OF

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Tumors of the Male Breast.

Schuchardt (*Archiv f. klin. Chirurgie*, Bd. xli., Heft 1) publishes an elaborate statistical study of tumors of the male breast.

In all, he has collected four hundred and sixty-nine cases. He finds, contrasting the disease as it affects men and women, that 15 per cent. of all tumors involve the breast, and that of these only 1 per cent. is found attacking the male breast.

The average duration of malignant breast tumors was eight months longer than is the case with women; operation greatly prolonged the duration of life. The disease was generally central—that is, placed below the nipple; preceding eczema was noted in two cases, and very frequently the beginning of the disorder was attributed to traumatism. In 24 per cent. of those questioned on this point cancer existed in the family. Death was due usually to asthenia dependent upon metastatic processes which the autopsy records show to be more frequent among men suffering from malignant disease of the breast than among women.

THE TREATMENT OF STRICTURE OF THE MALE URETHRA.

DR. J. WILLIAM WHITE (*University Medical Magazine*, vol. iii., No. 6, 1891), after giving his views *in extenso* as to the treatment of organic stricture of the male urethra, summarizes them as follows:

1. Strictures of large calibre—that is, of more than No. 15 French, situated at or behind the bulbo-membranous urethra—are to be treated, almost without exception, by gradual dilatation.
2. Strictures of large calibre, occupying the pendulous urethra, are to be treated by gradual dilatation when very recent and soft, and by internal urethrotomy when of longer standing, distinctly fibrous in character, or non-dilatable. It is to be remembered that the great majority of so-called strictures of large calibre of the pendulous urethra are merely points of physiological narrowing.
3. Strictures of the meatus and of the neighborhood of the fossa navicularis should be divided upon the floor of the urethra whenever it is evident that they are real pathological conditions producing definite symptoms, and not normal points of narrowing.
4. Strictures of small calibre (less than No. 15 French) situated in advance of the bulbo-membranous junction, unless seen very early and found to be not usually soft and dilatable, furnish the typical condition for internal urethrotomy, which should be done preferably with a dilating urethrotome, and invariably with all possible antiseptic precautions.
5. Strictures of small calibre (less than No. 15 French) situated at or deeper than the bulbo-membranous junction should be treated, whenever possible, by gradual dilatation. In a case of resilient irritable or traumatic stricture in this region, or of stricture, which, for any reason (as the occurrence of rigors), is non-dilatable, external perineal urethrotomy is the operation of choice.
6. Strictures of the deep urethra permeable only to filiform bougies should be treated by gradual dilatation when possible, the filiform being left *in situ* for some time, and followed by the introduction of others, or used as a guide for a tunnelled catheter. If the stricture be not suitable for dilatation, external perineal urethrotomy should be performed.
7. Impassable strictures of the deep urethra always require the performance of perineal section.

THE TREATMENT OF TUBERCULAR ARTHRITIS BY IODOFORM INJECTIONS.

KRAUSE first employed intra-articular injections in the treatment of tubercular joint disease only in those cases where the pathological process was so far advanced that surgical interference offered the only chance of betterment. Results, even in the suppurative cases, were so satisfactory that the treatment was applied to less severe cases, not excepting those in the incipient stages of arthritis, in the hope that not only might the disease be arrested, but that the function of the joint might be preserved.

Within the last ten years (*Archiv. f. klin. Chirurgie*, Bd. xli., Heft 1) many tubercular knee- and hip-joints, and a few of the ankle, wrist, and elbow, were subjected to the iodoform treatment. Cure was accomplished in a large percentage of the cases, the results being especially satisfactory in cases presenting disease of the knee or wrist. There were also a few instances where the disease proved obdurate; thus an amputation became necessary in one case, in another tubercular meningitis developed four weeks after the evacuation and injection of the iodoform.

In some instances of advanced wrist-joint disease, associated with discharging sinuses and pulmonary disease, where excision or amputation seemed the only resort, the injections proved most satisfactory. A cure took place with movable and useful fingers, though the diseased joint became firmly ankylosed. Some almost incredible cures of knee-joint disease are fully reported.

Aside from the admirable results which this treatment yields, it possesses the advantage of being readily applied, and of requiring only the subsequent care and attention called for by a minor surgical operation.

When abscesses are formed, either intra- or extra-articular, these are evacuated by means of a large abdominal trocar thrust through the skin drawn to one side, so that, on removal of the instrument, the opening may be valvular. The pus is drained away, all detritus is washed out by a 3 per cent. boric acid solution, and the abscess cavity is moderately filled by injecting a 10 per cent. mixture of iodoform in glycerin. The trocar wound is closed by an antiseptic compress, and moderate pressure is applied to the diseased part. From four to ten drachms of the iodoform mixture may be injected at one time. Incision is sometimes necessary when the discharge will not flow through the canula. When there is no abscess cavity a very small canula should be employed to carry the medicament to the diseased tissues. A comparatively small amount need be injected in children, a drachm and a half frequently proving sufficient. In whatever condition the joint may be, it is vigorously manipulated immediately after the injection for the purpose of thoroughly distributing the iodoform throughout the diseased area.

The wrist-joint is best reached by thrusting in the trocar just below the styloid processes of the radius and ulna; to enter the elbow-joint it may be thrust in immediately above the head of the radius, which can be felt readily on pronating and supinating the arm; the shoulder-joint is most accessible, either external to the coracoid process, or external to the scapular spine as it merges into the acromion process; to reach the hip-joint a three-inch trocar is required, this is entered just above the trochanter major, the leg being adducted and inverted, and is carried slightly forward until it strikes the head of the bone, when in forcible adduction it may be carried into the joint. A puncture beneath the patella will reach the knee-joint; the ankle-joint may be penetrated by thrusting in the trocar immediately below the malleoli and then turning its point upward and introducing it still further.

Two Cases of Rupture of the Bladder.

Under this caption Rose (*Deutsches Zeitschr. f. Chirurgie*, Bd. xxxi., Heft 2 and 3), in addition to a careful study of the symptomatology of fractures of the pelvis with injury to the urinary tract, contributes the histories of two cases of bladder rupture.

If, after an injury, the urine contains blood, even a small quantity, intimately intermingled with the fluid and not appearing in clots, and if, in addition, there is tenderness in the region of the kidney, the diagnosis of rupture of the kidney may be made safely. If there is retention of urine with a flow of blood from the meatus, it is quite certain that the urethra is ruptured.

Both kidneys and urethra are much more frequently ruptured than is the bladder. When the latter viscus is involved, anuria and blood on catheterism are the most characteristic signs. In the first reported case, two days after severe traumatism to the pelvis, laparotomy was performed, although the patient was uræmic and suffering from purulent peritonitis and beginning infiltration; a long rip of the bladder was found. The infiltrated urine was washed out, drainage was employed, and the external wound and the suppurating extra-peritoneal sac was packed with iodoform gauze, and the bladder was drained by a permanent catheterization. The patient recovered.

The second case suffered from an extra-peritoneal rupture of the bladder. The operation was performed the second day after the injury. The wound was treated by the open method, and though six months were required to accomplish this result the patient finally recovered.

The Treatment of Complete Prolapse of the Rectum.

Harrison Cripps (*Lancet*, vol. ii., No. 15, 1890), while granting that complete excision may at times be necessary for the cure of complete prolapse of the rectum, holds that the risks involved in the operation, and the probability of causing subsequent stricture, should lead the surgeon to leave this as a last resort.

In linear cautery he believes that we have an alternative operation founded upon sound physiological principles and attended with very slight risk.

Since prolapse is due to the slipping of one coat of the bowel on the other, together with want of sufficient rigidity in its walls to prevent invagination, the binding the muscular and mucous coats together, and at the same time stiffening the walls by inflammatory deposit, would seem to be plainly indicated. An exudation artificially produced in the submucous tissue meets this indication by cementing the coats firmly together, thus effectually preventing slipping, and at the same time giving the bowel sufficient rigidity. The actual cautery is admirably fitted to produce an abundant inflammatory exudate. Before performing the operation the bowels should be thoroughly emptied. The patient should be anæsthetized and placed in lithotomy position. If possible, the prolapse should be made to protrude; four lines of cautery are then drawn along the bowel in its long axis. These lines should begin well within the canal of the bowel at the apex of the protrusion and terminate at the anal margin; they should be about one-quarter of an inch in width, and deep enough to thoroughly sear but not actually destroy the mucous coat. Where the cautery lines cross large veins these should be tied on each side by passing a threaded needle beneath and knotting. If much time is spent in the operation swelling will take place and the reduction will be difficult.

In case the prolapse cannot be made to protrude, the bowel may be cauterized *in situ* by using the duck-bill speculum, which may be shifted when necessary. The actual cautery is most satisfactory, since Paquelin's instrument is too hot when first applied and loses heat too readily. After operation a thick India-rubber tube one-third of an inch in calibre and seven inches in length is passed into the bowel for five inches. Strips of oiled lint are then packed around the tube, extending as far as possible into the bowel. Cotton-wool well dusted with iodoform is finally packed into the tube and in and about the anus; thus firm support is given and at the same time the escape of flatus is not prevented.

Special care must be taken to prevent the descent of the bowel during the early stages of healing. In forty-eight hours the first dressing is removed, the parts are washed, and a clean dressing is applied. After the first few days the dressing can be dispensed with, but the tube is retained for ten days. During this time the bowels should be kept locked by small doses of opium. Evacuation is finally accomplished by means of castor oil and enemata. The patient must not be allowed to strain, and must empty the bowel while lying on his side with the anus drawn a little from the middle line. This should be enforced for at least six weeks, during which time consolidation is taking place.

THE ETIOLOGY OF SECONDARY INFECTION IN WOUNDS AT THE BASE OF THE SKULL.

It is a well-known fact that after gunshot wounds involving deeper organs the patient may for a long time exhibit no unfavorable symptoms. The external wound in the meantime heals promptly, and yet, after a lapse of time, and frequently with great suddenness, symptoms of septic absorption may develop. These symptoms are usually inaugurated by a violent chill, after which are developed the characteristic features of local and general infection.

In this relation an interesting case is communicated by FRANKEL (*Wien. klin. Woch.*, 3te Jahrg., No. 44). The patient, aged thirty-two, shot himself with a twenty-two calibre revolver in the left temporal region. The probe showed that the wound was a penetrating one. There were no brain symptoms, the external wound closed promptly after antiseptic dressing, and in twenty-one days the patient seemed completely well, having left his bed. At this time he was suddenly attacked with a severe chill followed by headache and high fever; death ensued in five days. Autopsy showed that the bullet had passed inward between the dura mater and the supra-orbital plate of the frontal bone, fracturing and comminuting the latter. When this fractured bone was chiselled out there was found, immediately beneath, a collection of thick, mucous, brownish fluid. Cultures from this, from various parts of the intensely injected brain, from the fluid in the ventricles, and from the blood in other parts of the body, showed that it was a case of septic infection from the diplococcus pneumoniæ.

This is not the only case in medical literature in which acute meningitis has been caused by the pneumococcus, although the patient was not at the time suffering from pneumonia. It would, then, seem imperative to practise, as a prophylactic measure, most careful disinfection of the nasal cavities in cases of wounds of the base of the skull where such injury may directly or indirectly communicate with these cavities. Since injection under pressure may be the means of forcing septic germs into uninfected areas, Fränkel advises recourse to careful iodoform-gauze tamponade.

A MODIFIED SUTURE FOR INTESTINAL ANASTOMOSIS.

SACHS (*Centralblatt für Chir.*, No. 39, 1890, p. 737), after referring to the various methods now in use, explains his modification of Senn's bone-plate method. Instead of two plates he uses one piece of bone, which he compares to a cuff-button with a hole through it. It more nearly resembles a pulley-wheel.

At the desired place for anastomosis the lateral surfaces of the intestinal loops are approximated by suturing serous membrane to serous membrane. A longitudinal incision is then made into each section of gut parallel to the line of suture. The bone button is then slipped in so that the line of suture with the two internal incised edges fits in the groove. The outside edges will fall into place in the other side of the groove, and a few stitches approximating serous surfaces will be found sufficient to retain the parts firmly.

The advantages claimed for this method are:

1. The intestinal lumen is not kept open long.
2. The line of incision is protected from infection by the internal ring—which also prevents closing of the incision.
3. Compression of the intestinal edges is prevented.
4. The sutures do not penetrate the whole thickness of the intestine.

The author has only used this method upon guinea-pigs. The buttons are made of decalcified beef-bone.

GUNSHOT WOUND OF THE ABDOMEN.

Two cases of gunshot wound of the abdomen are reported by T. W. HUNTINGTON and G. A. WHITE (*Occidental Medical Times*, vol. iv., No. 12, p. 636).

The men were middle-aged whites who were shot in an affray near Sacramento. The ball was of 38-calibre in each case. They received medical attention five hours after the injury.

In the first case the ball entered the left hip at a point three inches below the crest of the ilium and four inches posterior to the anterior superior spine. Thence it passed inward, upward, and forward, and was located beneath the skin at a point one-half inch above and one inch to the right of the umbilicus. Laparotomy was performed, and six perforating wounds of the gastro-intestinal tract were discovered: one in the anterior wall of the stomach near the great curvature, and the others in the small intestine. The wounds were closed with continuous catgut sutures for the muscular and mucous coats, and interrupted Lembert sutures for the peritoneal coat. A small quantity of blood—no fæces—was washed from the peritoneum with plain warm water, and the abdomen was closed without drainage. Duration of operation two hours and fifteen minutes. The convalescence was uninterrupted.

In the second case the ball entered the abdomen midway between the umbilicus and the symphysis pubis. It passed diagonally to the right, through the right ilium, and was found buried in the gluteal muscles two inches below the crest of the ilium, and five inches below and posterior to the anterior superior spinous process. Expectant treatment was followed in this case. The man had violent peritonitis accompanied by uncontrollable vomiting and singultus which lasted for ten days. He finally recovered, with a discharging sinus in the hip. There were no certain signs of intestinal perforation in the latter case.

OPERATION FOR TUMORS OF THE INTESTINE.

In a paper upon this subject (*Archiv für klin. Chir.*, Band xl., Heft 4, S. 905) KÖNIG gives the results of operation in thirteen cases of tumor of the intestine.

In three of these cases the laparotomy was nearly exploratory, as it was found that removal of the tumor was impossible on account of adhesion to surrounding structures, and no obstructive pressure was exerted upon the intestinal tract. In three other cases, although the tumor was found impossible to remove, yet it was necessary to make an artificial anus on account of the stenosis which had resulted.

Of these six cases, one died as a result of the operation, in six days, of peritonitis. Two were still living. One died six weeks after the operation, of marasmus. One was dying at the end of four weeks, and one succumbed to carcinoma at the end of three months.

In the other seven cases radical operations were performed. In five of these cases the intestine was resected and the divided ends brought together; in two an artificial anus was formed after resection.

Of these patients four died as a result of operation. Three died out of the five in whom resection and suture of the intestine was performed; and one died of those in whom an artificial anus was made after resection. The second patient—with an artificial anus—died of recurrence one year after operation.

Of the two patients who survived the operation of resection and suture, both are still living, one three years after removal of a carcinoma of the ileum, and the other six months after removal of tuberculous intestine.

In one case, which made in all fourteen that were submitted to operation, the diagnosis of tumor of the intestine was not confirmed by laparotomy. The thickened flexure of the colon, bound down by a band of adhesion, had presented the appearance, and been mistaken for, carcinoma. The patient was cured by removal of the adhesion.

A NEUROPLASTIC OPERATION.

H. H. A. BEACH (*Boston Med. and Surg. Journal*, vol. xxiii., No. 24, p. 562) describes a new operation designed for the restoration of nerve-trunks which have been destroyed by injury or disease. The nerve-sheath is opened in either direction for a distance somewhat greater than the length of nerve destroyed. The nerve-trunk is then partially divided at the scar in a vertical direction to its axis. The nerve is then split to within one-third of an inch of its end, and the flap thus formed is thrown over across the gap, and is sutured to the other divided end of the nerve. The author has not performed this operation, but presents it for trial in suitable cases.

TUBERCULOUS KIDNEY.

A case of tuberculous kidney is communicated by **LECLERQ** and **TOURNIER** (*Lyon Médical*, an lxv., 22). The diagnosis was a matter of some difficulty. The sign to which Mollière has attached some importance, namely, the absence of copaiba odor in the urine when that drug is administered, directed attention to the kidneys. Polyuria, acid reaction, together with abundance of pus, pain in the right lumbar region, progressive cachexia, and fever, pointed strongly to the probability of a tuberculous involvement of the kidney. Careful search of the urine was made for the bacilli, but this examination was negative. But slight pulmonary lesions could be found.

The autopsy showed slight tuberculous involvement of the lungs, miliary tubercles of the left kidney, and the transformation of the right kidney into a purulent sac containing several ounces of pus.

A SECTIONAL SPLINT.

DR. F. BIERHOFF (*Med. Record*, vol. xxxviii., No. 19, 1890, p. 518) has designed a sectional splint for use in the treatment of fractures on the field, or in country practice where a long splint is poorly adapted for transportation and not always obtainable.

The splint consists of five pieces of light, strong wood, each piece being eighteen inches long by three wide, and three-eighths of an inch thick. On the sides of the pieces are grooves or depressions for binding the portions together. The depressed portions are one and one-half inches in length and three-sixteenths of an inch in depth, three inches apart, and one and one-half inches from either end, so that, with the sections in position, all are three inches apart.

A METHOD OF APPLYING PLASTER JACKETS WITHOUT THE SAYRE SUSPENSION APPARATUS.

DR. N. E. FOREST (*Med. Record*, vol. xxxviii., No. 19, 1890, p. 519) offers a new apparatus for use in applying the plaster jacket. It consists of a wooden frame two and one-half feet wide by six feet long. At the upper end of the frame is a crossbar by which the child can hold. To apply the dressing, a piece of unbleached muslin is stretched across the frame, which is placed in an inclined position, the head being elevated while the foot is on the floor.

The child is placed upon the muslin, with the arms extended and grasping the head-bar. Traction can be made on the feet if necessary. A triangular opening is made in the muslin on each side of the child, so that a strip is left supporting the back. The plaster bandage is then applied, being passed through the triangular openings, outside the strip of muslin, thus incorporing it between the shirt and the plaster.

OTOLOGY

UNDER THE CHARGE OF

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Operation for Correcting Deformity Due to Prominent Ears.

Dr. George H. Monks has considered various methods of rectifying the deformity of prominent ears, and has decided that a surgical operation involving merely the skin on the back of the auricle affords the surest and greatest relief (*Boston Medical and Surgical Reporter*, December 22, 1890). Operations including both skin and cartilage are called for, in his opinion, only where the cartilage is stiff, and hence are applicable principally in adults.

When the excision of cartilage does not seem to be necessary, excision of the skin alone will correct the deformity. "The shape of the ellipse of skin to be removed from the back of the ear will vary, to a certain extent, with each case. Undue prominence of the ear at any one point should call for resection of a specially broad piece of skin at that point. . . . In all cases the inner incision should be close to the bottom of the sulcus, where the skin of the back of the ear joins that on the side of the head." The edges of the incision made by the removal of the ellipse of skin are to be brought together by six or seven stitches of silk or catgut, the wound treated antiseptically, and the auricle forced against the head. A bandage should be worn for a period of ten days or two weeks, and at night for several months a bandage or a nightcap should be worn to prevent dragging on the cicatrix by the patient when turning in his sleep.

Osseous Ankylosis of the Stapes in Chronic Dry Catarrh of the Middle Ear.

Dr. L. Katz, of Berlin, presented several microscopic specimens from the ear of a woman, thirty-nine years old, who had become deaf from a so-called dry catarrh of the middle ear, or, more properly expressed, from a chronic interstitial inflammation of the foot-plate of the stirrup bone and its environs at the oval window (*Deutsche med. Wochenschrift*, October 2, 1890). Hearing was reduced to loud words spoken directly into the ear. The membranæ were nearly normal in appearance, presenting nothing to account for the deafness. It further appears that the deafness had been progressive for thirteen years, and the patient had been long annoyed by roaring in her ears, like the sound of rushing water. Her father became deaf at the age of sixty years, but her brothers and sisters possessed normal hearing; she had never been syphilitic. The disease of the stapes in the oval window in this case was considered by Katz to be due to an arthritis of a rheumatic nature. While such an inflammation in any larger joint is usually treated with success by keeping it quiet, it is impossible in the case of the stapes, however, to observe immobility, as it is called into action by every sound.

The form of inflammation observed in this case is not developed from serous, mucous, or purulent inflammations in the middle ear, but from almost unknown causes; sometimes from hereditary influences, in the second or third decennium of life. It generally begins with light subjective noises, which gradually increase, and may continue for months or years without any decrease in hearing. Hence these noises are often miscalled "nervous," and erroneously referred to hyperæmia, or anæmia of the brain. In a normal stapes the inner surface of the foot-plate, as well as its edges, are covered with hyaline cartilage. The same is found around the edges of the oval window. The foot-plate of the stapes does not fill up the entire space in the oval window, but between it and the circumference of the oval window is found the so-called annular ligament, constituting a symphysis. In this ligament occur, according to Katz, and as shown in his specimens, the first inflammatory processes of progressive hardness of hearing. From this it extends to the cartilage, and then the bone. In this case the foot-plate was increased to four times its usual size, and formed with the adjoining bone of the oval window and annular ligament a uniform mass, in which only a faint trace of the joint could be detected. The cochlea was normal, Corti's organ intact, and the auditory ossicles free from disease, as were also the intrinsic muscles of the middle ear. The affection was the same on both sides.

Concerning treatment of this ankylosis it is stated that only surgical measures will avail. Notwithstanding the recommendation of some to remove the stapes, Katz regards the operation as difficult and dangerous. Difficult it certainly is, but it has not been shown to be dangerous; rather the reverse by Kessel's operations. Bromide of potash has little effect, and inflations of the tympana none. Better results are obtainable by rarefication of the air in the external ear, which acts like a dry cup on the membrana tympani and its adjuncts.

As the affection is primarily rheumatic, according to Katz, he recommends at the outset small doses of salicylate of soda and antipyrine.

THE JUGULAR FOSSA AND DEFICIENCIES IN THE BONY FLOOR OF THE TYMPANIC CAVITY.

DR. OTTO KÖRNER, of Frankfurt-on-the-Main, draws attention to this important subject, and adds to our knowledge concerning it. (*Archiv für Ohrenheilkunde*, vol. xxx., 1890). Numerous observers have called attention to these dehiscences in the partition between the drum-cavity and the jugular fossa. They are probably congenital, but may occasionally be due to erosion from congestion in the jugular vein. They demand consideration, because, by their existence, the mucous membrane of the tympanic cavity is in direct contact with the jugular vein, and in such a case a disease of the mucous membrane may spread to the wall of the bloodvessel, and induce hæmorrhage or pyæmia. Furthermore, in such an instance paracentesis of the membrana tympani may also incise the bulb of the jugular projecting into the tympanic cavity, as has been reported.[1]

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[1] Archiv für Ohrenheilkunde, vol. xxix. p. 234.

Probably phlebitis and thrombosis of the jugular occur more frequently than might be supposed from the few cases reported, through disease of a very thin dividing wall between the drum-cavity and jugular fossa, or directly through dehiscences in the bone.

It has long been known that the jugular fossæ on both sides of the same skull vary greatly in size and depth. These variations are induced by the varying size of the two jugulars. The investigations of Bezold, Rüdinger, Von Meyer, and Körner, show that in the majority of skulls the right transverse sinus is larger than the left. Rüdinger has shown that the right jugular fossa is, on the average, larger and deeper than the left. When this is the case, the osseous wall separating it from the drum-cavity is thinner and often perforated.

ON THE ETIOLOGY OF TINNITUS AURIUM.

DR. H. MACNAUGHTON JONES read a paper on the subject named above in the Section of Otology, British Medical Association, 1890. (Reported in *Medical Press and Circular.*)

The paper is based upon two hundred and sixty cases of tinnitus aurium, taken from the author's private note-book. Of these, 127 were males, and 133 females. The ages varied from under ten years (3) to eighty years. The youngest patient was three years old. The right ear was the seat of tinnitus 36 times, the left ear 53 times, and both ears 171 times. The ascribed causes were cerumen, 30; naso-pharyngeal catarrh, 28; nasal turbinate congestion and obstruction, 19; mental worry and over-strain, 14; sea-bathing, 12; scarlatina, 9; heredity, 8; effects of tropical climate, 8; the menopause, 8, injuries, 7; hypertrophied tonsils and tonsillitis, 7; abscess or inflammation of meatus, 7; cardiac disease, 7; gout, 5; uterine disorders, 5; measles, 4; syphilis, 4; alcohol, 4; rheumatic fever and rheumatism, 3; pregnancy, 2; Bright's disease, 2; ozæna, 2; decayed teeth, 2; facial paralysis, 1; puerperal septicæmia, 1; quinine, 1; adenoid growths, 1; from gun-concussion, 1; pneumonia, 1; parotitis, 1. In the remaining cases no cause was assigned.

The clinical conditions of the ear found in these cases were chiefly: catarrhal changes in the tympanum, 102; the same with closed Eustachian tube, 38; making really 140 cases of associated tympanic disease.

The hearing distance was normal in both ears in 18 cases. In 185 cases tinnitus and deafness alone were complained of; in 22 cases aural vertigo was also present. In 7 cases only were there any accompanying ocular symptoms. Attention is called to Ferrier's statement, that "the sense of hearing is in greater part situated in the temporal lobe, and more especially in the superior temporal gyrus of this lobe." Dr. Ferrier also is quoted as saying that "tinnitus may occur in both ears as the result of unilateral irritation, the effect of the intimate connection of the auditory nerves and centres."

Very slight causes may underlie tinnitus aurium, as for example: "A fine membranous husk of a hay-seed resting on the membrana tympani."

The following is a basis for a classification of the different causes and varieties of tinnitus aurium, condensed from the original:

1. Impulses originating in the temporal lobe or superior temporal gyrus, the cerebellum, or the auditory nuclei (in the medulla or pons), and referred as impressions to various situations—as the labyrinth or certain parts of the head. Such acoustic impressions may or may not be attended by deafness.
2. Impulses due to irritation, direct or reflected, in any portion of the auditory nerve.
3. Impulses originating in the peripheral ends of the auditory nerve (perhaps the most numerous class).
4. Irritation arising from interference with the intra-tympanic muscles.
5. Irritations transmitted by altered conditions of equilibrium of the air in the tympanic cavity.
6. Irritations due to disease in the middle ear and labyrinth.
7. Irritations arising in the external ear.
8. Some aural hallucinations, subjective impressions arising in the psycho-sensorial brain-centres, and having no objective cerebral or aural source of origin. Such hallucinations may become insane hallucinations. The latter may be divided into two distinct forms: (*a*) Hallucinations which arise subjectively in the brain when the auditory apparatus and nerves are healthy. (*b*) Hallucinations which are secondary to objective changes in the aural apparatus, and in which a tinnitus is developed that leads up gradually to a fixed illusion.
9. Therapeutical causes of tinnitus aurium.

Abscess of the Middle Ear.

Dr. Robert Barclay (*St. Louis Medical and Surgical Journal*, January, 1891) presents a most important and practical paper on the above-named subject. After a graphic description of the suffering caused by inflammation in various parts of the drum-cavity, he concludes as follows: "In abscess of the middle ear, operation on the drum-head for the release of et-up secretions being indicated, if the nidus of the abscess is in the malleo-incudal niche of the attic of the tympanum, cut freely to it through the membrana flaccida; if in the atrium also, or alone, operate as well, or only, upon the membrana vibrans, at whatever spot thereof bulges most; or, if its bulging be uniform, operate at the posterior-inferior quadrant."

Some Remarks on the Early Treatment of Otitis.

Dr. Samuel Sexton, under the above title, addresses to the editor of the *New York Medical Record* (February 7, 1891) some timely suggestions as to the early management of cases of acute inflammation in the attic region, especially in children. As the invasion of the disease is rapid, so the remedy should be sure and swift: no stabbing the drum-head in the dark, or fruitless incision into the canal. If the patient is a child have it narcotized, and then examine the ear carefully, under illumination with the electric head-lamp, worn on the forehead of the surgeon. Do not wait for days for spontaneous rupture, while injury may be done to deeper parts by extension the inflammation, but, with the patient etherized if a child or nervous adult, make an incision with a slender but strong paracentesis-knife through the membrana flaccida well into the attic. Immediate relief follows the liberation of the pent-up secretions. If the operation is done promptly, usually no further treatment is necessary.

IMPLICATION OF THE MASTOID CELLS OF BOTH EARS IN A CASE OF CHRONIC PURULENT OTITIS MEDIA.

DR. HUNTINGDON RICHARDS has observed a case of the above nature, and has reported " complete and rapid recovery following operation " on the mastoids (*New York Medical Journal*, January 17, 1891). The chronic purulent disease had lasted many years in both ears as a sequel of scarlatina. The patient, a man, thirty years old, of exceptionally strong constitution, had long shown great indifference to an endurance of severe attacks of pain in his ears, but at last the severity of his symptoms induced him to submit to operation; first upon one, and then upon the other, ear. Not only the sufferings of the patient, but the chronic discharge, was relieved, and the hearing greatly improved by the operations.

DISEASES OF THE LARYNX AND CONTIGUOUS STRUCTURES.

UNDER THE CHARGE OF

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PERFORATION OF THE ŒSOPHAGUS IN EMPYEMA.

DR. A. F. VOELCKER reports (*The Medical Press*, December 17, 1890) an instance of neglected empyema in a boy six years of age, in whom, some weeks after the operation, fluids that were swallowed escaped through the artificial opening which had been established for the relief of the empyema. The autopsy revealed erosion of the fifth and sixth ribs near their heads, of the ninth rib, and of the sides of the bodies of the fifth and sixth dorsal vertebræ. There were two openings in the œsophagus opposite the eighth and ninth dorsal vertebræ, the lower one just above the diaphragm, the upper one about three-quarters of an inch higher up.

CHRONIC TUBERCULOSIS (? SCLEROUS LUPUS WITHOUT EXTERNAL MANIFESTATIONS) OF THE NOSE, TONSILS, TRACHEA, AND MAIN BRONCHI, PRODUCING STENOSIS OF THE TRACHEA AND BRONCHI.

DR. THOMAS WHIPHAM and MR. SHERIDAN DELÉPINE report (*Trans. Clinical Society*, London, 1890) an interesting case of extensive localized tuberculous lesions in a boy fourteen years of age. Death ensued within six weeks after he came under their professional observation, nine months after the apparent onset of the disease, the decline seeming to have been very rapid. Tracheotomy, about fourteen hours before death, failed to relieve the fatal dyspnœa. The case is described in detail, and the histological appearances still more minutely. Considerable consideration has been given to the differential diagnosis between leprosy, lupus, tuberculosis, syphilis, rhinoscleroma, glanders, traumatism, and non-specific inflammations. An excellent bibliography is appended of authorities consulted in studying the case. The result arrived at is that the case must be considered as one of chronic localized tuberculosis, probably a form analogous to sclerous lupus; an opinion indorsed by the very able committee (Butlin, Cheyne, Kidd) appointed by the Society to examine into the case.

Diffuse Pemphigus involving Nasal, Oral, Pharyngeal, Laryngeal, Tracheal, and Conjunctival Mucous Membrane.

Dr. Landgraf reports in detail (*Berl. klin. Wochenschr.*, January 5, 1891) an interesting case in a man forty-eight years of age. In the spring of 1887, while a workman in tar products in a manufactory of chemicals, he began to suffer with burning sensations in his feet and pains in the brow and the eyes. Soon after, the nose began to be painful and to discharge a bloody secretion and bloody scabs; and at the same time a sensation of dryness of the pharynx came on despite copious salivation. Ticklings took place in the larynx as if something were lodged there, and often produced gagging. Dimness of vision in the right eye began at the end of the year, and in the left eye the month following.

Treatment had been unsuccessful up to date of entrance in the Charité Hospital, May 26, 1888. The patient appeared prematurely aged. Internal organs and the sensorium intact. No exanthem. No glandular swelling. He complains of bilateral difficulty of vision and of trouble in the nose and throat.

The conjunctiva of both eyes is shrivelled and its two surfaces adherent for a great distance, leaving but narrow slits for vision, through which the cornea is seen to be turbid and covered with newly-formed bloodvessels.

The nasal mucous membrane is covered with adherent scabs; and after removal of the scabs is found to be atrophic. The septum narium is perforated, and the edges of the orifice are slightly ulcerated. The anterior portion of the left lower turbinate bone is carious. The soft palate is adherent to the posterior wall of the pharynx by strand-like adhesions.

The pale mucous membrane of the pharynx and the mucous membrane of the larynx, and at least part of the trachea was covered with circumscribed moss-like patches of whitish-gray deposit, which, when removed, was shown to be composed in part of unchanged epithelial cells, and in part of undifferentiable detritus. The exposed mucous membrane was much congested and bled readily. Despite treatment, up to the spring of 1889, the condition grew worse. Vision steadily diminished. No changes took place in the nose. The process progressed gradually in the pharynx and larynx, the shedding of epithelial layers continuing in masses of greater or smaller, but circumscribed, surfaces. The mucous membrane of the interior of the larynx became thicker, and the passage gradually smaller. The epiglottis increased in bulk, and the vocal bands became adherent anteriorly. Finally, the swelling of the epiglottis became so extensive as to preclude further accurate observations. Despite the progress of the process, only very evanescent slight pains were endured until the beginning of winter, when the process began to extend over the mucous membrane of the mouth.

The disease in this case is regarded as pemphigus, despite the failure to notice any characteristic bulla. The chronic process began with patchy desquamation of the epithelium in the uppermost layers of the mucous membrane, and then gradually extended more deeply into the mucous membrane and into the underlying tissues. In some places, as in the nose, the result was atrophy; in others, as in the conjunctiva and pharynx, the result was shrivelling and adhesions of opposing surfaces; in others, again, as in the epiglottis and the laryngeal entrance, thickening of the mucous membrane. Furthermore, the septum narium underwent perforation, and the lower turbinate body became carious.

HOARSENESS.

In an excellent article on hoarseness in professional singers (*Journ. Amer. Med. Assoc.*, 1890), DR. SAJOUS, of Philadelphia, calls attention, among other better-known conditions, to a deficiency in the lubrication of the vocal bands, which he successfully combats by the use, every two hours, of a warm spray of a saturated solution of potassium chloride, and the administration of ten grains of ammonium chloride in a tumblerful of water at the same intervals. The last dose is taken at least three hours before a performance to avoid exposure during the subsequent stage of perspiration. Between acts he finds a lozenge containing two grains of the drug to be beneficial in some instances.

TUBERCULOSIS OF THE LARYNX.

SCHEINMANN (*Wien. med. Wochenschr.*, No. 35, 1890) applies pyoktanin to tuberculous ulcers by means of a heated probe dipped in the finely-powdered drug; cicatrization is secured without irritation after eight to ten applications.

PACHYDERMIA LARYNGIS.

Eleven cases are reported (*Deutsche med. Wochenschr.*, 1890) by DR. EDMUND MEYER, of Berlin, all in males, one twenty-seven years of age and the others varying from forty to fifty, and all implicating the posterior portion of the vocal bands. In seven of these cases impaired abduction of the vocal bands was marked, so much so in some of them as to produce severe dyspnœa on account of the median position of the vocal bands. All were benefited by the internal administration of potassium iodide, though in none of them does it appear that the little tumefactions underwent complete resorption. Meyer states that he has never seen a case in association with syphilis or tuberculosis, and he expresses doubts as to any such association.

There has been abundant evidence, however, that the chronic inflammation accompanying tuberculosis and syphilis, and the inflammatory processes immediately surrounding malignant and even benign growths, does at times result in producing this dermoidal transformation. Thus, Dr. O.

Chiari, of Vienna (*Wien. klin. Wochenschr.*, No. 41, 1890), has seen the disease produced from chronic irritation of various origin: abuse of spirituous drinks, chronic catarrh, tuberculosis, and syphilis. He has examined several larynges microscopically, in diffuse cases involving the inter-arytenoid region chiefly, and has found the epithelial layer thickened in some instances to five or six times its normal dimensions. He believes that the anterior surface of the inter-arytenoid fold is specially liable to diffuse pachydermia laryngis.

THE PART PLAYED BY MICROBES IN THE DEVELOPMENT AND SPONTANEOUS DETACHMENT OF LARYNGEAL MYXOMATA.

DR. EDWARD BOINET, of Montpelier, reports (*Annales des Mal. de l'Oreille*, etc., 1890) an instance of the rapid development and the spontaneous consecutive expulsion of three large supra-glottic myxomatous polypi from the larynx of an agriculturist, forty-four years of age. Examined histologically by Prof. Kiener, they were found in an advanced stage of necrosis, and filled with three species of microörganisms, which are described in detail; a special elongated bacillus being particularly noticeable in the region of implantation and the zone immediately adjacent, and to the special action to which the detachment of the polyps was attributed.

LARYNGECTOMY.

PROF. BARDENHEUER, of Cologne, reports (*Deutsche med. Wochenschrift*, 1890) that, of his first five cases, four died within eight to fourteen days in consequence of inefficient antisepsis. Of four subsequent cases, three total and one partial, all recovered from the operation, although one died six weeks after operation and three weeks after recovery therefrom, in consequence of extensive bronchial blennorrhœa which had existed previous to operation.

DR. ALEXANDER TIETZE publishes (*Berliner klin. Wochenschrift*, 1890) a short report of twelve extirpations of the larynx in the Königlichen chirurgischen Klinik, of Breslau. The twelve operations were performed on ten patients, and between the years 1879–1890. There were four cases of total extirpation. Two of these had been preceded by partial extirpation. Two of the patients were females. Nine cases were carcinomas; one was a sarcoma. The carcinomas were located in the epiglottis and entrance of the larynx in two cases; in the posterior wall of the larynx in one; in the left half of the larynx in two, and in the right half in four. The sarcoma was located in and above the vocal band of the right side.

Of the four total extirpations, one, a case of recurrence after partial laryngectomy, terminated fatally within three weeks. One lived four years and a half, four years without recurrence, and had been reported cured in the statistical record of Wassermann. One patient died of recurrence one year after operation. One died six months after operation and eleven months after a partial laryngectomy, by reason of a recurrence eroding the innominate artery.

Of the eight cases of partial extirpation, four died within fourteen days—three of putrid bronchitis and one of peritonitis of undetermined cause.

Two were subsequently submitted, as above mentioned, to the complete operation. One, the case of sarcoma, acquired a recurrence in nine months, was resubmitted to operation, and remains well one year after operation. The remaining case, of more than half a year's standing only, is still free from recurrence. In two cases only was the artificial larynx required. The other patients were content with their whispering speech. The tracheal canula could not be dispensed with in any instance.

DERMATOLOGY.

UNDER THE CHARGE OF

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The Absorption of Drugs from Ointments.

Luff's interesting experiments (*British Journal of Dermatology*, June, 1890; *Monatshefte für praktische Dermatologie*, Bd. xi., No. 2) bearing upon the absorption of drugs from the three common ointment bases, tend to show that, as regards this property, vaseline stands first, lard second, and lanolin third. The drugs employed were resorcin, carbolic acid, and iodide of potassium. The author very properly adds: "These experiments have all been performed with sheep's bladders, and it may be urged that the results obtained with dead tissue are scarcely comparable to those which a living tissue, such as the skin, might effect. The settlement of this point must be left to future experiments upon the living subject. . . . The practical lesson to be learned from these experiments is, that if an ointment is employed with the view of its active ingredient becoming absorbed, then vaseline is by far the best excipient to use; but if an ointment is employed for its local effect only, absorption of its active ingredient not being desired, then lanolin is the best excipient for such an ointment."

[A full abstract of this paper, as regards the method and the exact results obtained, appeared in this journal for February, the inferences to be drawn therefrom having been left to the reader. It seems, however, as conveyed to us in a personal note from Dr. Luff, that the brief presentation of the data has been misinterpreted, and we give, therefore, with great pleasure, this additional abstract containing the conclusions in the author's own words.—Eds.].

Pathological Histology and Nature of Lupus Erythematosus.

H. Leloir (*Archives de Physiologie*, 1890) put forth the view in 1883 that lupus vulgaris is an attenuated tuberculosis of the skin, which the more recent observations of others have more than confirmed. But concerning lupus erythematosus, the author's experience, embracing anatomical, bacteriological, and experimental researches, compels him to express the opinion that its tuberculous nature is far from being demonstrated. As is well known, for some dermatologists lupus erythematosus is of a scrofulo-tuberculous nature, while for others it is an affection distinct from lupus vulgaris. In lupus erythematosus there exists diffuse infiltration of the derma, especially localized in the upper strata. The infiltration consists of a great number of embryonal cells, grouped especially along the vessels, and nowhere in nodules as in lupus vulgaris. The hair follicles are generally enormously dilated in the first stage of the disease. The excretory ducts of the sudoriparous glands are invaded by infiltration and show granular fatty degeneration. The lesions of the epidermis are dry, and for the most part atrophic. There is no pathological analogy between the two diseases, as the author has pointed out in his numerous publications on the subject during the past seven years. He has never been able to find the least sign of the bacillus of tuberculosis in lupus erythematosus; and he adds that he knows of no dermatologist who has been more fortunate in his investigations. Experimental tests with inoculation in lupus erythematosus have also failed. Attention is called to the fact that lupus vulgaris in certain cases, where the nodules are confluent, superficial, congested, and seated in the papillary layer, may closely simulate lupus erythematosus. The work is illustrated with colored plates of the minute anatomy of the disease.

Mollin as a Base for Ointments.

Julius Kühn (*Berliner klin. Wochenschrift*, 1890) directs attention again to the preparation made by Th. Canz, apothecary, of Leipzig, known as mollin, and recommends it as a base for ointments. The preparation was introduced a few years ago, and Kühn's recent experience leads him to regard it as valuable. Mollin is a 17 per cent. over-fatted soap, and as a base for ointments possesses many advantages over lard and the petroleum products in the treatment of many skin diseases, especially those running a subacute or chronic course, such as seborrhœa, acne, psoriasis, and scabies. On account of its soapy nature, it should not be employed in the acute inflammations. Some of the numerous advantages claimed for it by the author are that it is a clean remedy and can be easily removed. It keeps well for years, even in hot climates, and it mixes intimately with the various medicaments in common use, such as mercury, chrysarobin, sulphur, tar, resorcin, salicylic acid, etc. Rapid cures of psoriasis, acne, and other diseases are reported.

Conclusions of the Committee of Physicians of the St. Louis Hospital, Paris, on the Treatment of Cutaneous Tuberculosis by the Koch Method.

In an interesting series of letters, Wickham has given (*British Journal of Dermatology*, February and March, 1891) a succinct report of the results obtained in the treatment of tuberculosis of the skin, especially lupus, by the special commission, consisting of such observers as Vidal, Fournier, Besnier, and Hallopeau. The cases were treated in the St. Louis Hospital, Paris, and numbered in all 38. The report, as given by this commission, was official and final, and upon the whole, strongly condemnatory. Briefly stated, the conclusions are as follows: They observed first, that in some cases the general reaction was so intensely alarming that death had been imminent; secondly, in eight cases congestion of the lungs resulted; thirdly, in two cases, hæmaturia; fourthly, in four cases, albuminuria; fifthly, in five or six cases, severe cardiac symptoms, such as violent palpitation and persistent systolic bruit at apex. The local reaction varied from extremely moderate to erysipelatous. As to the resulting action upon the disease, not one case was cured, not one case even nearly cured, and scarcely a visible improvement in any. On the contrary, twelve results nil, the lesions remaining as before, and eighteen very slightly improved. With the negative and uncertain results, and the risks incurred, the commission does not feel justified, from its own experience, in continuing, except in an experimental manner, this method of treatment.

OBSTETRICS.

UNDER THE CHARGE OF

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Ventro-fixation of the Uterus and Subsequent Pregnancy.

Gottschalk (*Centralblatt für Gynäkologie*, No. 8, 1891) reports the case of a multipara, aged twenty-eight years, from whom he had removed an ovarian tumor complicated with retroflexion of the uterus. The patient made an uninterrupted recovery. A year afterward the same patient came under Gottschalk's observation in the sixth week of pregnancy. Shortly afterward abortion occurred. The membranes and placenta were removed by the hand of the operator, and the uterus was found very high up in the pelvis and anteverted. In removing the placenta and membranes, the finger appreciated a difference in the two walls of the uterus; the anterior wall was thick and well preserved, while the posterior was almost as thin as paper. The explanation for this condition was found in the fact that the patient had been operated upon for a backward displacement of the uterus by the procedure known as ventro-fixation.

A Study of Placental Infarcts.

Jacobsohn (*Zeitschrift für Geburtshülfe und Gynäkologie*, Band xx., Heft 2) has examined large numbers of placentæ, finding in syphilitic patients, in those suffering from nephritis, and also in women apparently in good health, white infarctions on the placental tissue. These seem at times to have been without influence upon the life of the fœtus. In other cases, fœtal death undoubtedly resulted from their presence. In twenty placentæ examined, taken from healthy mothers whose children were healthy, forty-two infarctions were found, most of them upon the maternal side, occasionally supplemented by others upon the fœtal aspect. The most probable explanation of their presence seems to Jacobsohn to be as follows: The decidua undergoes a primary hyaline degeneration, and when in this condition the tissue can be stained by eosin and safranin. This process of degeneration attacks the endothelium of the bloodvessels, which, according to Waldeyer, are surrounded by decidual cells. The process gradually encroaches upon the intervillous spaces, coagulation of blood occurs, and the fibrinous portion of the infarct results from the clot. The villi of the chorion are finally destroyed so far as their functional activity is concerned, while in some cases the hyaline degeneration of the decidua destroys the villi by the encroachment of decidual cells.

A BACTERIOLOGICAL STUDY IN AUTO-INFECTION.

The marked reaction which has taken place against the prophylactic douche in healthy women suggested to **STEFFECK** the propriety of making a bacteriological examination of the birth-canal of such patients (*Zeitschrift für Geburtshülfe und Gynäkologie*, Band xx., Heft 2). His method consisted in removing a portion of the secretion of the parts, making cultures on appropriate culture media, and injecting the original matter and also cultures into the bodies of animals. Twenty-nine observations are reported in detail. Twelve of these gave positive results. In seven abscesses followed. In five general infection and death occurred. The germ most frequently found is the staphylococcus pyogenes albus. His experiments lead Steffeck to conclude that this germ, as well as streptococci, may cause puerperal infection which should be considered as auto-infection. Some inflammatory condition must be present, however, to furnish a place and opportunity for entrance to these germs. An examination of the statistics in the Würtzburg clinic for periods when no prophylactic douche was given illustrates the practical value of a preliminary disinfection.

RUPTURE OF THE UTERUS IN TWIN LABOR.

An interesting case of rupture of the uterus in twin labor is reported in the *Glasgow Medical Journal* for March, 1891, by **JENKINS**, a student in Pawlik's clinic at Prague. The patient had seven hours previously given birth to a living child at her home. When brought to the hospital her general condition was good. A second child was found in transverse position. The pelvis was not contracted. The upper margin of the lower uterine segment was discerned at the level of the umbilicus. Under chloroform, decapitation was performed by the hook. No difficulty was experienced in delivering the head and the body, but upon introducing the hand into the uterus a large transverse rupture was found half an inch above the level of the internal os, involving the entire left half of the uterus. The peritoneum was intact, and rupture had occurred before admission to the hospital. The placenta had projected through the tear, giving rise to a swelling which could be appreciated by palpation. It was found that adhesion existed on the right side of the uterus from former inflammation. The cavity between the uterus and the peritoneum was washed out with thymol and blood-clots were removed. The uterus was tamponed with iodoform gauze, the fundus pressed downward by an assistant. A large drainage tube was also introduced. The patient's condition was remarkably good. The subsequent history of the case was that of recovery in about three weeks, daily irrigation, with a vaginal tampon, and drainage having been continued. When discharged the external os was drawn to the left, and above it a granulating cavity as large as a walnut was found. The internal os was displaced to the right and closed, the uterus movable, bound down upon the right side by old adhesions, while upon the left side new adhesions were forming.

A Contribution to the Theory of Eclampsia.

Von Herff (*Münchener medicinische Wochenschrift*, No. 5, 1891) believes that the complex array of symptoms known as the eclamptic condition consists in a peculiar sensitiveness to irritation on the part of the sub-cortical centres. An easily decomposed material accumulates in the sub-cortical cells during gestation, resembling that found congenitally in patients suffering from nervous and psychical diseases, and in others intoxicated with urea, lead, alcohol, and infectious material. In other cases this condition seems to pertain to the physiology of the pregnant state. The condition known as eclamptic depends upon numerous organs of the body. When, in addition to this predisposing cause, active irritation is brought to bear, the result is frequently an outbreak of eclamptic convulsions.

One Hundred Cases of Induced Labor.

The literature of this subject is thoroughly reviewed, and the observations made upon one hundred cases are reported by Pinard in the first two numbers of the *Annales de Gynécologie* of the present year. He finds that once in one hundred and fifty pregnancies it is necessary to induce labor. Of the one hundred cases, one died of septicæmia resulting from infection during examination. Eighty-three of the children were born alive, sixty-seven of them surviving to leave the hospital. Version was performed fourteen times; the forceps used in twenty-one cases. In sixty-three cases Champetier's balloon was used to induce labor. This is a rubber dilator larger than a Barnes's bag, which is introduced and inflated and allowed to remain until expelled with the fœtus. Pinard considers the induction of labor at term justifiable only when the head can be made to engage by gentle pressure at the brim of the pelvis, and when the antero-posterior diameter of the pelvic inlet measures at least three and a half inches. To secure a living child he would induce labor at seven months in a pelvis of this size. He frequently employed Tarnier's dilator, which much resembles the Barnes's bag, the first dilatation being followed by the larger balloon.

The Vectis, or Obstetrical Lever, Combined with Traction.

Adopting the theory of Poulet that a flexible tractor is best in combination with forceps, Farabeuf and Varnier describe in a fully illustrated article

(*Gazette Hebdomadaire*, No. 8, 1891) a method employed by them in the treatment of transverse positions of the fœtal head. By introducing one blade of a long forceps-shaped instrument, the endeavor is made by leverage to bring the head, when in transverse presentation at the pelvic brim, down into the inlet of the superior strait. Both blades of this instrument are then applied as usual to the sides of the head, and cord or tape is passed through the extremity of the fenestra in one blade, and traction is made downward as in ordinary axis-traction. The head is thus brought through the superior strait, turned transversely, and rotation is expected in the centre of the pelvic cavity.

Extra-uterine Pregnancy.

Küstner (*St. Petersburger medicinische Wochenschrift*, Nos. 43 and 44, 1890) describes five cases of extra-uterine pregnancy treated by laparotomy and the removal of the fœtus and appendages. Recovery ensued in all the cases. Of especial interest is the case of a patient, aged forty years, who had borne four children, and in whom the cessation of menstruation for three periods was followed by hæmorrhage persisting for six weeks, accompanied by the discharge of brownish particles. Shortly after, a second derangement of menstruation occurred, followed by a discharge of blood and shreds of membrane, the patient afterward complaining of intense pain in the region of the sacrum. Upon examination under an anæsthetic the uterus was normal; posteriorly upon the right side a hard body of considerable size was felt, while the left ovary and tube were somewhat enlarged. Upon laparotomy, it was discovered that double extra-uterine pregnancy had existed. Extra-uterine abortion had occurred in each case, and in both tumors microscopic examination revealed the presence of fœtal appendages. The extra-uterine pregnancy upon the left side had occurred nine years before the operation, and abortion had resulted at four months. Upon the right side pregnancy had occurred one year and seven months prior to operation, and the abortion had occurred at three months' gestation. Küstner's case makes twenty-one of double extra-uterine pregnancy. No positive cause for its recurrence was detected, and probably a persistent catarrhal salpingitis is the most rational explanation.

Banga (*Journal of the American Medical Association*, No. 4, 1891) describes two cases of early ectopic gestation in which a diagnosis was made before operation, and in both of which a successful result was obtained. A point of practical interest in connection with one of the operations was the method employed to check hæmorrhage, which consisted in using a tobacco-bag tampon filled with iodoform gauze after the method of Mikulicz. In hæmorrhage occurring deep in the pelvis, pressure can often be made most advantageously by this expedient. One of the cases was that of hæmatoma of the broad ligament, resulting in the disintegration of the Fallopian tube of that side. Later on this developed into an hæmatocele in Douglas's pouch. The other case was that of extra-uterine pregnancy in the middle of the tube, a portion of whose muscular fibre was tremendously hypertrophied, while its opposite side was greatly thinned. The amnion was intact, containing an ounce of fluid and a fœtus five weeks old.

INSTANT DEATH FROM AIR IN THE UTERINE VEINS IN THE FOURTH MONTH OF PREGNANCY.

HEKTOEN, pathologist to the Cook County Hospital (*North American Practitioner*, No. 3, 1891) reports an interesting case of death occurring after a vaginal douche, the patient being in the fourth month of pregnancy. The post-mortem examination revealed air in the sub-peritoneal vessels, in the coronary vessels, and in the right ventricle and auricle. Intra-uterine pregnancy of four months existed, the patient otherwise being healthy. There was no air in the veins of the broad ligaments, in the vena cava, or pulmonary arteries. The membranes had disappeared, and at the lower margin of the placenta, which was two and a half inches in diameter, a separation from the wall of the uterus had taken place three-quarters of an inch long. Beneath this separation the openings of the uterine sinuses could be readily distinguished. The air probably entered the circulation in considerable quantity at one time; the douche was taken with a Davidson's syringe which leaked. It is supposed that intermittent uterine contractions followed the injections, causing partial separation of the placenta, and that when relaxation occurred air entered the placental sinuses.

A SUCCESSFUL PORRO OPERATION.

In the *Indian Medical Gazette*, No. 2, 1891, a successful Porro operation upon a patient having a small pelvis is reported by SURGEON-MAJOR MACLAREN. The patient had been five days in labor, the child was dead, the membranes having ruptured, and the uterus was firmly contracted. She seemed moribund, and embryotomy was not permissible. The usual amputation was performed, the cervix being transfixed with a couple of steel knitting-needles, an India-rubber tube passed firmly around the cervix, below the needles, controlling the hæmorrhage. A glass drainage-tube was inserted on the umbilical side of the stump, which was dusted with aristol. The patient's recovery was uncomplicated.

THE DIAGNOSIS OF CONGENITAL MALFORMATION OF THE HEART.

This somewhat difficult subject is treated of in a very clear and satisfactory manner by HOCHSINGER in the *Wiener Klinik*, Heft 2, 1891. He concludes his treatise as follows: Endocardial murmurs over the orifices of the heart, with cyanosis and exaggeration of the second sound, point conclusively to a congenital inflammatory change in the valves at the venous openings. Harsh murmurs heard over the sternum, accompanied by cyanosis and exaggeration of the second sound, point to a patulous foramen ovale. Clear heart-sounds, with a high degree of cyanosis and a marked exaggeration of the second sound of the heart, indicate a congenital transposition of the origin of the aorta and also the origin of the pulmonary artery from the left ventricle. Cardiac murmurs which are not heard loudest over the valvular orifices of the heart, but which are accompanied by cyanosis and exaggerated second sound, point to a combination of congenital defect in the septa between the cardiac chambers and transposition of the valvular orifices.

PREGNANCY COMPLICATING CANCER OF THE CERVIX; VAGINAL EXTIRPATION; RECOVERY.

TAYLOR, of Japan (*Medical Record*, No. 9, 1891) describes an interesting case of a patient aged forty-one years, who had carcinoma of the cervix, and early pregnancy, the exact period of which could not be ascertained. During the operation the bladder was torn, but was immediately closed and vaginal extirpation of the uterus performed. Considerable difficulty was experienced in bringing down the uterus, and hæmorrhage was finally checked by the use of forceps, ten of which were left compressing the tissues. Although the patient showed signs of collapse a few hours after the operation, she subsequently rallied and made an uninterrupted recovery. Some time after the operation she was in good health and actively employed. The uterus measured five inches in length, three and three-quarters in breadth, and two in thickness. The fœtus was of about two months' development.

THE BLOOD OF THE PREGNANT AND PARTURIENT WOMAN AND ITS RELATION TO THE AMNIOTIC LIQUID.

SCHRÖDER (*Archiv für Gynäkologie*, Band xxxix., Heft 2) has made a study of the blood in pregnancy and parturition in a series of forty-two cases. After reviewing the work of others, he concludes that anæmia is not a normal condition during pregnancy; that while there may be a slight decrease in the number of corpuscles and in the amount of hæmoglobin, yet that this decrease is never more than slight, and it commonly gives place to a normal condition of the blood early in the lying-in period. In proportion as women during pregnancy are without abundant food and subjected to hard labor amid unfavorable surroundings, anæmia is found to result. Labor causes a transient diminution in the corpuscles and hæmoglobin of the blood, especially marked where hæmorrhage occurs, as in placenta prævia. When the secretion of milk is well established the anæmia of pregnancy and labor gives place to a normal condition of the blood and often to an increase in its corpuscles and hæmoglobin. Schröder is led to conclude that the amniotic liquid is a serous transudate from the maternal bloodvessels.

GYNECOLOGY.

UNDER THE CHARGE OF

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CHYLE-CYST OF THE MESENTERY.

GUSSEROW (*Charité Annalen*, xv. Jahrg.) describes a mesenteric cyst, removed by abdominal section, the character of which was discovered on microscopical examination of the contained milky fluid, in which were found characteristic fatty and granular corpuscles. This was still further confirmed by the absence of an epithelial lining in the cyst. On account of its size, it was impossible to infer whether it had arisen from dilatation of a lymph vessel or from cystic degeneration of a gland. The cyst was partially excised, and the remainder stitched into the abdominal wound, with good result.

PREGNANCY IN A UTERUS DUPLEX, COMPLICATED WITH PYOCOLPOS.

GUSSEROW (*Charité Annalen*, xv. Jahrg.) reports a unique case of *pyocolpos lateralis*, in a double vagina, with spontaneous rupture of the purulent contents into the cervical canal of a double uterus on the *opposite* side to the affected vagina. Pregnancy had advanced to the three months within the uterus on the *same* side, and was mistaken for accompanying pyometra, the ovum being removed on curetting.

THE ANATOMICAL DIAGNOSIS OF HÆMATO-SALPINX.

WALTER (Inaugural-dissertation, Giessen, 1890; abstract in *Centralblatt für Gynäkologie*, January 24, 1891), from careful microscopical observations, arrives at the conclusion that true hæmato-salpinx may be mistaken for ectopic pregnancy, not only because of their similar gross anatomy, but from the fact that bodies closely resembling chorionic villi are found in sections of the former; the former are, however, composed of structureless membrane, and are to be regarded as simply threads of fibrin. The presence of decidual cells must be demonstrated before the diagnosis of tubal gestation can be positively made. Other appearances are due to preëxisting catarrhal salpingitis.

THE SIGNIFICANCE OF CERTAIN UTERINE DISPLACEMENTS.

NIJHOFF (*Nederl. Tijdsk. v. Verlosk Gynäkol.; Centralblatt f. Gynäkologie*) summarizes a paper on this subject as follows:

1. Uterine displacements are often secondary to either peri-uterine inflammatory processes, or to a pathological condition of the uterus itself; this applies particularly to antero- and latero-flexions.
2. The symptoms accompanying a displacement are nearly always referable to the coexisting pathological deviation.
3. Treatment should be applied to the *lateral* deviation; when this is overcome the actual displacement of the organ may be cured without further treatment, or if it persists it gives rise to no pain or functional disturbance.
4. In classifying the different varieties of retro-displacement, it is more important to lay stress upon the mobility or fixation of the uterus than upon the degree or displacement.
5. Ventro-fixation is indicated after unsuccessful treatment of the existing complications.

OVARIAN ABSCESS.

SCHAFFER (*Centralblatt für Gynäkologie*, January 10, 1891) reports two cases in which laparotomy was performed. The differential diagnosis lies between pelvic abscess, pyosalpinx, and suppurating ovarian cyst; the latter can only be made after microscopical examination of the wall, which in an abscess shows only a pyogenic membrane without any trace of an epithelial layer. All authors admit that extirpation of ovarian abscesses presents peculiar dangers, on account of the intensely septic character of the pus. In both cases the streptococcus pyogenes was found in pus, and pure cultures were obtained. In numerous examinations of the contents of a pyosalpinx the writer was never able to find them; and observations have been made by Orthmann and Menge with negative results, save in three cases. This fact, which speaks for the greater virulence of pus from ovarian abscesses, as compared with tubal, is explained by the fact that the ovarian tissue offers a better nidus for the pus organisms than the tubal mucosa. Rupture of a pyosalpinx is accordingly far less serious than rupture of an abscess of the ovary. Martin calls attention to the fact that suppuration of the ovary rarely accompanies gonorrhœal salpingitis, but is usually found in cases of pyosalpinx following septic endometritis, especially the puerperal form.

Epicystotomy for Malposition of the Ureter.

Velits (*Budapesti kir Orvosegyesulet; Centralblatt für Gnyäkologie*) reports a unique case, that of a girl, aged fourteen years, who had a third ureter which opened into the urethra. Tauffer performed epicystotomy, extirpated the terminal end of the duct, and sutured the remaining portion to the bladder, with perfect success.

Cysto-fibroma of the Ovary of Unusual Size.

Peters (*Nederl Tijdskr. v. Geneeskunde; Centralblatt für Gynäkologie*) removed an ovarian tumor weighing fifty-one and one-half pounds, which proved to be a true fibro-cyst containing numerous communicating cavities. Drainage with iodoform gauze. Rapid convalescence.

Nerves of the Human Ovary.

Vedeler (*Norsk Mag. f. Mägevid; Centralblatt für Gynäkologie*), from careful microscopical studies of the normal ovaries of a young girl who died suddenly, states that the final distribution of the nerve-filaments is the same as in the ovary of the sheep, *i. e.*, they accompany the bloodvessels and supply the muscle-fibres, but cannot be traced to the Graafian follicles.

Ovulation and Menstruation.

Cohnstein (*Centralblatt für Gynäkologie*, January 17, 1891) arrives at the following conclusions: 1. There is a direct causal relation between the ovarian and catamenial functions; the activity of the ovary precedes and causes the uterine flow. 2. If the ovary is inactive, neither does true menstruation occur, nor those changes in the uterus which accompany the monthly flow. 3. The ovaries may be functionally active without the occurrence of menstruation, as during lactation; the persistence of this activity is recognized by the response of the ovary to stimulation. 4. Menstruation may occur before the normal period, but it is none the less directly dependent upon preceding ovarian irritation, as from coitus. 5. The ovaries seem to alternate in forming ripe Graafian follicles. 6. It has not been proved that follicles rupture at every menstrual period.

STEINHAUS, in a monograph on this subject (abstracted in *Centralblatt für Gynäkologie*, February 7, 1891), reviews all the various theories which have been advanced, and arrives at the conclusion that none of them is perfectly satisfactory. Menstruation, he believes, is to be regarded as a special function of the oviduct, independent of that of the ovary. But, when the latter organ atrophies, atrophy of the oviduct follows, hence the cessation of its independent function, menstruation. This simple theory explains at once the persistence of the menstrual flow after castration, and reconciles the disputed views with regard to the relation between ovulation and menstruation.

[Unfortunately for the author's theory, pure castration, or removal of the ovaries alone, is now practically unknown. The persistent metrostaxis (*not* menstruation) after salpingo-oöphorectomy must be explained otherwise, as the effect of a continuous uterine congestion, due to pelvic induration or adhesions.—ED.]

THE TREATMENT OF PROLAPSUS AND RETROFLEXION BY LAPAROTOMY.

KÜSTNER (*Centralblatt für Gynäkologie*, January 17, 1891) reports fourteen cases in which he performed laparotomy. He resorts to it only when the ordinary methods of treating displacement (including Brandt's and Schultze's) prove ineffectual. It occasionally happens that, while the uterus is movable, the patient cannot wear a pessary on account of some anatomical peculiarity of the vagina or local tenderness, or several plastic operations may have failed to accomplish the desired result. If the organ is firmly fixed in an abnormal position, the indication for ventro-fixation is clear. The writer recognizes two classes of cases in which laparotomy is performed —in patients who are still capable of bearing children, and in those who have reached the menopause. In the former the adhesions should simply be separated (preferably with the Paquelin cautery), the adnexa not being removed unless they are extensively diseased, and the uterus retained in its normal position by a suitable pessary; in the latter, after breaking up the adhesions, the uterus should be attached to the anterior abdominal wall. In order to avoid the formation of fresh adhesions, strict asepsis is to be observed during the operation, with the avoidance of all injury to the peritoneum by mechanical or chemical irritants.

[The writer asserts that abortion is the inevitable consequence of pregnancy occurring in a uterus that has been sutured to the anterior abdominal wall, a statement which has been disproved by the experience of at least four German and American gynecologists, who have reported cases in which parturition occurred at term without complications or change in the position of the uterus.—ED.]

THE FORMATION OF PERITONEAL ADHESIONS ATER LAPAROTOMY.

THOMSON (*Centralblatt für Gynäkologie*, January 31, 1891), after making a series of elaborate experiments and bacteriological studies in animals, makes the following deductions:

1. Adhesions of the omentum and intestine occur after perfectly aseptic laparotomies; exact apposition of the edges of the abdominal wound with silk sutures is the best means of preventing extensive adhesions.
2. Superficial erosions of the peritoneum heal without further consequences.
3. In order to prevent parietal adhesions of the intestines they should always be covered with the omentum previous to closing the wound.
4. Septic peritonitis following laparotomy may be due to atmospheric infection.
5. Sterilized gauze within the peritoneal cavity may cause the formation of adhesions.

FORCIPRESSURE IN VAGINAL HYSTERECTOMY.

In a recent discussion on this subject at the Dresden Gynecological Society (*Centralblatt für Gynäkologie*, January 31, 1891) SCHRAUM commended the use of Richelôt's clamps, as they shortened the operation, saved loss of blood, and by causing extensive necrosis destroyed diseased tissue beyond the actual wound. He had not found that they caused excessive pain, as was claimed by some. The smaller forceps were removed at the end of twenty-four hours, the larger at the end of forty-eight.

LEOPOLD had noted unusual pain after using the clamps; he thought that there was great danger of carrying septic infection by means of them.

KLOTZ had twice used the forceps, and each time the patient had extreme pain after the operation, which he was able to assign to no other cause. He could see no advantage in using them instead of ligatures, as the latter could be applied rapidly and without excessive loss of blood. Cases in which the tissues were clearly diseased beyond the edges of the wound were such as were unsuitable for the radical operation.

MEINERT said that he had determined in future to extirpate the uterus even where the disease was advanced, since the patient's condition was really better than after a palliative operation. In these cases he had found the clamps especially valuable; in fact, it was sometimes impossible to use ligatures. He had never observed that their presence gave rise to excessive pain. He always removes them at the end of twenty-four hours, although five hours after the operation there should be no danger of hæmorrhage.

ABDOMINAL EXTIRPATION OF FIBROID UTERI.

CHROBAK (*Centralblatt für Gynäkologie*, February 28, 1891) reports four successful cases of complete extirpation, and describes at length his method of procedure. He would not abandon supra-pubic amputation, with extraperitoneal treatment of the stump, since be has operated by this method fifty-five times with only three deaths, but he believes that it possesses certain objections, which are entirely absent when the entire uterus is removed. In the latter operation no tissue is left behind which may become necrotic, and thus cause infection.

His technique is as follows: Unusual care is employed in disinfecting the vagina and cervical canal, the latter being cleansed with a 1 per cent. solution of sublimated alcohol, after which an iodoform pencil is introduced into the uterine cavity, and the vagina is tamponed with iodoform gauze. After the uterus is lifted out of the abdominal wound the broad ligaments are ligated in sections as low down as possible and divided close to the uterus. The anterior and posterior reflexions of the peritoneum are then divided, and the bladder is dissected away as low down as the cervix. The latter is now constricted with a rubber cord, and the tumor is excised. The stump and cervical canal are thoroughly cauterized, the latter is packed with iodoform gauze, and is closed with two or three sutures. An assistant removes the vaginal tampon and presses the posterior fornix upward on a grooved sound, with which as a guide the operator opens the fornix; passing his finger through the opening it is then easy for him to ligate and divide the lower portions of the broad ligaments and to complete the separation of the bladder. The cavity may be tamponed with strips of gauze, the ends of which are carried through into the vagina, or the vaginal vault may be completely closed with sutures introduced from within. The writer's practice is to unite the peritoneal edges by interrupted sero-serous sutures, covering the stumps of the broad ligaments with peritoneum in the same manner. After thorough cleansing of the pelvic cavity, the coils of intestine are allowed to fill it, and the external wound is closed, peritoneum, fascia, and skin being united separately. Lastly, the vagina is tamponed with iodoform gauze.

The average length of the operation described is about two hours, but the additional time required is more than compensated for by the excellent results. Whether prolapse of the vagina and bladder are liable to result from loss of support or not he is unable to say, for, although he has not yet observed this result, it is quite conceivable, since the conditions after removal of a large fibroid uterus are quite different from those which are present after ordinary vaginal hysterectomy.

TACHYCARDIA AT THE MENOPAUSE.

KISCH (*Internationale klinische Rundschau*, March 1, 1891; *Birmingham Med. Review*) calls attention to certain peculiar cardiac disturbances at the climacteric, chief among which is a paroxysmal tachycardia, occurring in plethoric subjects. Early in the period they are troubled with palpitation, which may persist for a few minutes or for several days. Associated with palpitation are feelings of apprehension, constriction of the chest, violent pulsation of the carotids, flushing and congestive headache. Vertigo and syncope may be present. The pulse ranges from 120 to 150, but is full and regular. The normal heart-sounds are exaggerated, but no organic murmurs are heard. The ordinary symptoms of cardiac disease, dyspnœa, dropsy and albuminuria, are absent, showing that the trouble is purely functional. The phenomena are to be ascribed to reflex irritation of the accelerator nerves, and no treatment is necessary beyond laxatives, exercise, and cold sponge-baths.

Less frequently we meet with a weak heart, especially in anæmic patients or those who have lost a good deal of blood during the pre-climacteric period. The heart-beat is rapid and weak, the pulse feeble and irregular. These patients have dyspnœa, are liable to attacks of angina, and show evidences of obstruction to the circulation, œdema, and albuminuria.

In still a third class an accumulation of pericardial fat at the climacteric gives rise to serious disturbances, especially to dyspnœa and palpitation on exertion. In more marked cases venous stasis, œdema, and albuminuria appear, and even grave pulmonary complications, but by careful regulation of diet these may be held in check until the period of danger is passed.

Nephrectomy for Uretero-vaginal Fistula.

Gusserow (*Charité Annalen*, xv. Jahrg.) met with an interesting case of uretero-vaginal fistula, in which he first performed kolpo-kleisis, having made a vesico-vaginal fistula. The latter closed, so that it was necessary to reopen it; then, after it had remained open for three months, kolpo-kleisis was again performed, and the patient was relieved for a year, at the end of which time she returned with cystitis and a collection of calculi in the vaginal pouch, which had caused a separation of the cicatrix. Nephrectomy was then performed, successfully, as a last resort.

PÆDIATRICS.

UNDER THE CHARGE OF

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A Case of Tracheotomy for Croup in an Infant Eighteen Months of Age; Cured.

Didier (*Lyon Médical*, No. 29, 1890, p. 393), in the Charité during the winter months of 1889 and 1890, had the opportunity to make twelve tracheotomies in children under six years of age, attacked with croup. Five of the cases recovered. One is of particular interest on account of its age, eighteen months. Rabot remarks that cases of recovery under two years of age are unusual. Upon admittance the tonsils were swollen and engorged, presenting white patches, but without ganglionic involvement; dyspnœa marked and occurring in spasms. Tracheotomy was at once performed with ease and without much hæmorrhage. Upon the introduction of the canula an enormous piece of false membrane was expelled, the convulsions and nervous phenomena at once ceased; breathing was tranquil; no stitches were taken and the wound was dressed with carbolized gauze. The child passed through an uninterrupted convalescence, the temperature at no time reaching over

39° C.; the patient was discharged from the hospital in three weeks entirely cured.

Since the diphtheritic cases have been isolated at the Charité there have been tracheotomized fifty-nine infants from the age of five to twenty-four months inclusive, with the following results:

Twenty at the age of twenty-four months: three cured. Two at twenty-three months: one cured. Three at twenty-two months: all died. Two at twenty-one months: all died. Four at twenty months: all died. One at nineteen months: died. Eleven at eighteen months: all died but one (the subject of this review). One at seventeen months: died. Two at sixteen months: one died. Two at fifteen months: both died. One at fourteen months: died. Two at thirteen months: fatal. Five at twelve months: all died. One at eleven months: died. One at ten months: died. One at five months: survived the operation for eight hours.

Sanne, in his *Traité de la Diphthérie* (1878), published twenty-three cases known in France and abroad, in which cure occurred in tracheotomized infants between seven and twenty-three months inclusive, thus classified:

Sixteen less than eighteen months old; two cases of eighteen months, operated upon by Potain and Moutard-Martin; and five older. He adds to the preceding, four incomplete successes in children who survived twenty-three, twenty-five, twenty-eight, and forty days after the operation.

Didier thinks that it is probable that many cases of young infants who have survived the operation have not been reported. Peter adds one case of cure at eleven months; several successes at sixteen months; one child of fourteen months, at the Hospital Necker, by Coffer; two cures of infants of twelve and eighteen months, by Hartmann; and a successful crico-tracheotomy by M. Geffrier d'Orleans, on a child of eleven months.

If we follow Sanne's example, and only take the cases under twenty-three months inclusive, we eliminate from the statistics the three cures of two years upon twenty children operated upon at that age, and there only remain two successes to add to the preceding: first, the case of Didier, that we are considering; and, second, a communication by the same writer of a successful case in a child of twenty-three months, who was brought to the hospital with diphtheritic patches upon the buccal cavity, superimposed upon plaques of impetigo; excessive dyspnœa and general spasms.

Tracheotomy was performed by the interne, and excepting an attack of suffocation, which arose when the canula was removed to cleanse it, the child passed through a rapid and speedy convalescence to perfect health.

Didier adds still another case, a girl, aged seventeen months, in whom croup was present but diphtheria absent; tracheotomy was performed; at the end of a week the child was in good condition, but on attempting to remove the canula suffocation was produced, and it was necessary to reintroduce the canula; three more attempts were made to remove it, all, however, were followed by the same symptoms. In nineteen days the child entirely recovered.

These cases seem to prove that the tender age of the child is not a contra-indication to the performance of the operation; this statement is in accordance with the conclusions of Trousseau; and, indeed, Despine and Picot go still further, and say that we, as careful physicians, should not refuse the child this chance for life, no matter what the age. Notwithstanding these statements, the statistics of thirty-nine operations under two years of age is not flattering.

Didier was most unfortunate in that some of his patients contracted measles while convalescing from tracheotomy, the complication proving fatal. When croup arises as a complication of the eruptive fevers many French operators refuse to tracheotomatize.

THE TREATMENT OF WHOOPING-COUGH.

In a lecture delivered at the Hospital for Sick Children, Paris, JULES SIMON (*Journal de Médicine*, 1890, p. 577) remarks that the treatment of the first period is of great importance, for the future progress of the case depend upon the care which is given to it at that time.

One must be well convinced, contrary to the method which was followed formerly, of the necessity of keeping the child indoors; it is often even necessary to keep him in bed as one would do for a serious attack of bronchitis. Archambault has insisted upon the importance of this fact, and since Simon has adopted the same plan he has observed almost no complications in whooping-cough in children who were cared for in time. The pharmaceutical means are not to be neglected, but at best are only secondary; belladonna is, perhaps, the best of all. It is well to employ the following formula: Tincture of aconite root, tincture of belladonna, elixir of paragoric, equal parts—ten, twenty, or thirty drops a day, according to the age of the patient; if there is fever increase the aconite, or if intestinal catarrh increase the paregoric. Chloral may be given in the evening and sulphate of quinine in the morning. These drugs may be used by injection, the former in 15-grain doses, and the sulphate of quinine in three- to five-grain doses, especially if the heart is agitated. We must combat the catarrhal secretions if they are too abundant; under these circumstances an emetic may be given once a week; with the infusion of wild narcissus (daffodil) given every two or three days one obtains a state of mild nausea which favors the expulsion of the secretions; rhatany will also diminish them, of this we may give from three to five grains of the extract before each meal. Coffee is advised, to combat the dyspepsia. The treatment for the third period is that directed to the bronchial adenopathy; it consists principally in the use of tonics, iodine, cod-liver oil, etc., and later, an outdoor life.

To the remedies referred to above one may add with advantage, in certain cases, henbane, to combat the meteorism, in doses of from two to ten grains a day, warm friction of the abdomen with chamomile oil, containing tincture of nux vomica, 4 parts to 100, combined with digitalis when there is anuria, a thing that often happens.

A CASE OF SPINA BIFIDA WITH SUPPURATIVE SPINAL MENINGITIS AND EPENDYMITIS, DUE TO BACTERIA ENTERING THE WALL OF THE SAC.

HOLT and VAN GIESEN (*Journal of Nervous and Mental Diseases*, 1890) record the case of a child who died in the fourth week of life, which shows quite clearly how a purulent inflammation of the wall of the sac and its dependent lesions of the cerebral nervous system may be due to the entrance of pyogenic bacteria into the sac, and to their extension, along the fluids, meninges, or central canal of the spinal cord, to the brain meninges and ventricles.

At autopsy the volume of the lateral ventricles was found to be at least forty or fifty times their volume in a normal brain of the same age, but there was no corresponding expansion in the diameter of the brain; indeed, the brain itself was perhaps a trifle smaller than usual; five ounces of thin yellowish pus escaped from the ventricles during the removal of the brain. The lateral ventricles, their horns, and the third ventricle were everywhere lined with a thin, translucent, red membrane, having the appearance of granulation tissue. The meninges and the substance of the spinal cord were uniformly congested; the sac contained about half an ounce of pus.

Microscopical examination of the skin of the sac demonstrated beneath or internal to the subcutaneous connective-tissue of the skin, a zone of irregular thickness, composed of necrotic tissue; here great numbers of bacteria, of three kinds, were found: a few short, thick bacilli, some large cocci, and—the most numerous, predominating form—small cocci in chains and clusters.

In the section from this region in two places, microscopic plug-like continuations of the necrotic zone extended through the entire thickness of the excoriated central portion of the skin of the sac and communicated with the outer surface of the skin; these two plugs contain many small cocci.

In the section stained with Gram's method and examined with the Zeiss one-twelfth oil-immersion lens, small cocci, like the predominant form in the sac wall, were present in the pia mater, in the anterior fissure and its communicating channels, in the anterior commissure, in the exudate plugging the central canal, and in the pellicles lying over the pia mater; these cocci were also noted in a flake or pellicle of pus on the pons, in the walls of the third ventricle, the upper portion of the aqueduct of Sylvius, and of the lateral ventricles.

The morphological identity of the small cocci in the different regions, and the absence in the brain and cord of the other two forms of bacteria in the sac indicate the small cocci as the real pathogenic agents, and that the associated bacteria are merely contaminating forms. As far as can be determined by their dimensions and grouping, and by comparing them with other known species of pyogenic micrococci in control sections, the small cocci in this case are thought to be the streptococci pyogenes.

The Pathogenesis of Digestive Disorders of Bacterial Origin During the Nursing Period.

According to Escherich (*Jahrb. f. Kinderheilk.*, Bd. xxxi., Hefte 1, 2) digestive disorders in infants arising from the fermentation of milk, or from some condition in the contents of the intestines, must be distinguished from infectious diseases of the intestine which are due to microörganisms independently of the form of nutrition. The occurrence of the latter is associated with the fermentative activity of certain very common germs in an appropriate medium and under definite external relations. These germs form certain organic acids, which are irritating to the intestinal canal; and also ptomaïnes, the effect of which upon the central nervous system of infants is seen in the severe symptoms which accompany summer diarrhœa. Fermentation processes may be of ectogenous or endogenous origin. The former are concerned almost exclusively with cow's milk and may begin within a few hours after the milk has been drawn. The lactic-acid fermentations are due to the breaking-up of the milk sugar, and vary according to the temperature at which the milk is kept. Endogenous fermentation may be a continuation of the ectogenous, and is easily possible, since the infant's stomach is not rich in hydrochloric acid, by which germs introduced with the food are easily destroyed. Fermentation processes associated with a milk diet, both in the stomach and small intestine, lead to acid dyspepsia and diarrhœa, by the destruction of the milk sugar. If the sugar reaches that portion of the intestine where it may be absorbed, the conditions will then be favorable for the decomposition of albumin. Milk which has undergone ectogenous fermentation will cause acute intoxication, with violent local symptoms of irritation, and sometimes collapse, cyanosis, and dyspnœa. One form of endogenous fermentation is the isolated stomach fermentation with acid vomiting, atony, and ectasis of the organ. Other forms are the small-intestine fermentation with its acid diarrhœa, and the large-intestine fermentation with phenomena of mild colitis. Dyspepsia which is due to starch fermentation is very different from the sugar dyspepsias. In the former there is an acid feculent diarrhœa due to the presence of undigested starch in the lower portion of the bowel, and this tends to develop into chronic intestinal catarrh. After a while there may be symptoms resembling cholera, or the upper portion of the intestine or the stomach may be implicated.

PUBLIC HEALTH.

UNDER THE CHARGE OF

EDWARD F. WILLOUGHBY, M.D.,

OF LONDON.

Weil's Disease.

Physicians in the Southern States, where bilious fevers of every form are rife, may be able to render valuable aid in the solution of the question whether "Weil's Disease" is to be recognized as a distinct specific and communicable disease, or to be considered only as a form of relapsing fever intensified by coexisting or previous malarial poisoning. It appears to be more or less prevalent in Egypt, Syria, and the Balkan States, and a number of accurate and careful observations have, during the past year, been published in the Austrian and Slavonian medical journals. Dr. Frantisek Sumbera[1] reports three cases, Staff-surgeon Th. Hueber[2] four, and Dr. Justyn Karlinski[3] five; the first two contending for its specific character, which is doubted by the last, on the grounds that all his patients had suffered from malaria, that relapsing fever was prevalent in the district, the brother of one being in the hospital for it at the same time, and that he found in the blood of all a spirillus very like that of relapsing fever, though somewhat smaller and more comma-shaped.

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[1] Dr. Frantisek Sumbera: Sbornik Lekarsky, iii. 2, 3, p. 298. 1890.

[2] Dr. Th. Hueber: Deutsch. milit. ärztl. Zeitschr., xix. 1. 1890.

[3] Dr. Justyn Karlinski: Fortsch. d. Med., viii. 5. 1890.

Sumbera's patients, on the other hand, tradesmen between forty and fifty years of age, and Hueber's, soldiers from twenty-two to twenty-five years, had all been in good health up to the date of their attacks.

Sumbera's three cases and one of Hueber's ended fatally, the other three recovering, though very slowly. Only one of Karlinski's died, the other four making rapid recoveries, notwithstanding their previous enfeebled health. It is, therefore, by no means improbable that Karlinski interpreted the nature of their illness correctly, and that he had to deal with quite a different disease from that described by Sumbera and Hueber, in whose cases the course and symptoms of the attack and the post-mortem appearances presented so remarkable a uniformity, that one description will serve for all:

It set in suddenly, with rigors, headache, vomiting, fever, and pains in the back and limbs. Jaundice appeared variously between the second and fifth days. Angina was in Hueber's cases a distressing symptom. The jaundice was soon followed by marked enlargement of the liver, spleen, and inguinal glands. The urine was scanty and high-colored, albuminous or bloody; there was bilious or bloody diarrhœa, the breath was extremely offensive, and the liver and spleen tender. Death occurred in all on the ninth or tenth day, preceded by low delirium and coma. Post-mortem examination in all four fatal cases showed general icterus, fatty degeneration of heart, liver, etc.; hæmorrhagic pachymeningitis; the liver deeply bile-stained, and with dull swelling of the parenchyma; acute interstitial hæmorrhagic nephritis; and internal hæmorrhages in various organs. Neither observer was able to detect the spirillus in the blood.

Wassilief identifies this disease with the typhus biliosus or icterodes kartulis of Smyrna; though he admits that the ill-trained practitioners of Asiatic Turkey and Egypt may mix up many cases of relapsing and pernicious malarial fevers with the true Weil's disease.

Etiology of Tetanus.

Tetanus, as distinguished from the tetanic spasms of strychnine-poisoning, and the opisthotonus, etc., incident to some myelites, has generally been considered as a disease, or aggregate of phenomena, consisting essentially of a tonic spasm of all the muscles of the body, beginning with those of the jaws and neck, and ending with those of respiration. Two forms have been recognized—the traumatic and the idiopathic; the former always following the reception of some wound, either one into which dirt has entered, or which has taken on an unhealthy character; the other, in which no such cause has been discovered, has been attributed to exposure to cold and wet—such an explanation being, however, based on negative evidence.

But the researches of Carle and Rattone, Nicolaier, Rosenbach, Briéger Beumer, Langer, and Eiselsberg, leave no room for doubt that it is properly to be classed among specific diseases, and that the phenomena are caused by the entrance into the organism of a microbe which exists outside of the body, and is widely or almost universally distributed in earth and dust. It has been induced in animals by the injection of emulsions of, or the juice expressed from, the sciatic nerve of men or other animals that have died of the disease. Nicolaier used common garden soil with success, though the same earth, when baked or otherwise sterilized, merely set up local irritation and abscesses. Rosenberg discovered and used a bacillus present in the substance of the nerves of tetanic individuals; Briéger employed a chemical product derived from pure cultures of the bacillus; Beumer used all these means; and Eiselsberg has recently reinvestigated the whole question.

The first impulse to research in this direction was given by Drs. Carle and Rattone, who, observing an extraordinary proportion of cases of tetanus among a number of workmen admitted to the hospital in consequence of injuries received by the fall of some old buildings in course of demolition, concluded that there must have been some common and local cause, and thought that it was most probably to be found in the dust that had entered the wounds. Inserting some of the dust gathered from the place into the subcutaneous connective tissue of various animals, they produced tetanus in the larger proportion.

Langer reported the case of five horses who died of tetanus after castration with the same écraseur, which, having been subsequently boiled in oil, was used without ill results.

Eiselsberg, having verified by experiment the results obtained by all previous observers, comes to the conclusion that the belief in the spontaneous origin of some cases of tetanus, like those of erysipelas, is based on errors of observation, some abrasion being present though unnoticed.

The greater frequency of tetanus after wounds, especially lacerated wounds of the hands and feet, is easily accounted for by the fact that, in the acts of grasping or treading, such wounds are most likely to be attended by the entrance of dirt.

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LINEAR CRANIOTOMY (MISCALLED CRANIECTOMY) FOR MICROCEPHALUS.[1]

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I HAVE entitled this paper "Linear Craniotomy" instead of "Craniectomy," the word proposed by Lannelongue and formerly used by myself. The operation is practically a long incision in the skull, the removal of a part of the bone being merely incidental to its being a hard instead of a soft tissue. The termination "-ectomy" usually and of right signifies the entire removal of the part preceding this termination, *e. g.*, oöphorectomy, omphalectomy, nephrectomy, etc. Removal of the cranium (as craniectomy means) being scarcely intended or done, our nomenclature should fit the facts. Dr. Bauer uses the word craniotomy in reference to his case (see below), but trephining is, I think, the proper one to describe his operation.

In *The Medical News* of Nov. 29, 1890, I published a case of linear craniotomy for microcephalus. The object of the present paper is to report the later history of this case and two additional cases that I have had, as well as brief notes of one kindly furnished me by Drs. B. Sachs and A. G. Gerster, of New York, and another, similar, furnished me by Dr. J. C. McClintock, Professor of Surgery in the Kansas Medical College, making, with Lannelongue's two cases and Wyeth's case, eight in all that have been done so far; and to refer to two other cases done before my own, for the same disorder and with the same intention, but by methods which I cannot think should be classed as craniotomies.

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[1] Read in the Surgical Section of the American Medical Association, Washington, May, 1891.

In The Medical News for April 25, 1891, is a notice of a recent report by Lannelongue, of twenty-five cases, which I saw too late to incorporate into my paper, hence I can simply call attention to it in this way. There was but one death.

Case I.—(For earlier history see *The Medical News*, Nov. 29, 1890.) Since the operation this child has certainly improved steadily and considerably, but not at all to the extent of the case reported by Lannelongue. She screams scarcely at all, sleeps better, notices a watch when held before her, observes things about her, and has used a number of words occasionally, but not constantly. She drools but little, and has almost lost the restless wringing of the hands which was so marked a peculiarity before the operation.

February 17, 1891. A precisely similar operation to the first was done upon this patient at the Jefferson Hospital. The improved forceps enabled me to do it in thirty-five minutes instead of an hour and a quarter. She was entirely well in five days. No drainage was used.

March 24. The child is slowly improving. I do not see that her progress has been any greater since the second operation than before.

Case II.—K. K., girl. Patient of Dr. F. X. Dercum.

Condition, May 23, 1890.—Age, one year (when first brought to Dr. S. Weir Mitchell at the Orthopædic Hospital and Infirmary for Nervous Diseases). Very small. Makes no attempt to walk or sit; moves arms well; feet and hands cold; muscles flabby. Circumference of head $14\frac{1}{4}$ inches; diameter, biparietal, 4 inches; occipito-frontal, 4.5 inches. Knee-jerk slight, sensation good, no clonus, no rigidity. Fontanelle closed. Nose bridge very wide. No mental development; hearing and vision good; does not speak at all; disposition good. Passes water and stools without notice. Spine straight. Five teeth. A general restlessness comes on at times; usually excessively cheerful.

Both parents alive and well. Father and mother are first cousins. No venereal history; no consumption in the family history except a sister of the father who contracted consumption. The mother has been married five years and has two children, of which the patient is the younger. Her brother is four years of age, and is strong. He was breast-fed; is hydrocephalic; circumference of head 53.3 cm.

The patient was born at term. Labor lasted twenty-four hours and was very hard. No instruments were used. Patient was very small in size. No palsy, but very weak. No fontanelle existed at birth and her head has not grown since, though her body has. She was breast-fed for three months, and since then bottle-fed. She had a cold in her head for six months.

Condition, December 1 (nineteen months of age).—Cannot sit alone; constantly in motion. Twelve teeth. Circumference of head 36 cm. ($14\frac{1}{4}$ in.). Biparietal, 10.3 cm. ($4\frac{1}{16}$ in.); biauricular, 10.2 cm.; bitemporal, 8.3 cm. ($3\frac{1}{2}$ in.); occipito-frontal, 11.9 cm. ($4\frac{3}{4}$ in.). Circumference of chest, 38.2 cm. ($15\frac{1}{8}$ in.). Height, 69.8 cm. (27.5 in.). Weight, 12.5 pounds. [I append the following normal measurements at birth from Schroeder's *Lehrbuch der Geburtshülfe:* Length, 50 cm. Head—Bitemporal, 8 cm.; biparietal, 9.25; occipito-frontal, 11.75 cm.; circumference, 34.5 cm.] Top of head quite prominent. Can hold things in her hand; cannot feed herself. Moderate contraction of flexors of both feet; legs not paralyzed, knee-jerk absent, no ankle clonus. Idiotic expression in repose. Frontal lobe retreating. Two convulsions this summer, two last winter, each time with teeth. Has the expression of a precocious idiot. Attention can be won, but only momentarily. Mind and eye flit from one thing to another quickly.

Operation at the Infirmary, December 3, 1890.—An incision was made one inch to the left of the middle line, parallel to the sagittal suture and six inches in length. A curved incision was then made from the anterior end of this line downward so as to lift a frontal flap, the scar of which would be hidden by the hair. A half-inch button of bone was removed by the trephine, and from this anteriorly and posteriorly a furrow a quarter of an inch wide was cut out of the bone, extending to within an inch of the supra-orbital ridge and an inch above and to the left of the inion. The length of the furrow was five inches.

The amount of hæmorrhage from the scalp was very slight—much less than I have found it in adults. The bone was very thin, about one to one and a half mm. only, but bled freely. Opposite the parietal boss the dura was very adherent to the bone, but at all other points was separated easily. When the point of a pair of scissors was put under the flap of bone thus loosened and the handle of the scissors let down gently, the simple weight lifted the flap perceptibly. The periosteum corresponding to the bone removed was cut away. The dura had not been opened, and appeared normal.

A few strands of horsehair were placed in the furrow and the wound dressed. The operation lasted half an hour. Temp. at its close 98°.

13*th* (10th day). The wound healed kindly and quickly and in five days the stitches were out. During the process of healing the child showed unusual fluctuations of temperature, the highest being, however, only 100.8°, for which no apparent cause could be found. After keeping the child a few days longer in the hospital to be sure of a safe recovery, she was sent home to-day. The hospital attendants are decidedly of the opinion that she is quieter and claws at her head much less than she did before the operation, though for myself I can scarcely see much difference.

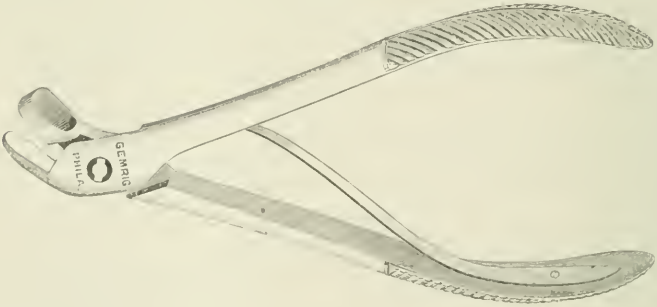
March 2, 1891. The child has improved very much in general mental condition, but not so rapidly as I could wish. Accordingly, to-day I did a linear craniotomy on the other side of the head in precisely the same manner as the former operation. The operation was wholly completed in twenty minutes by the new forceps.

24*th*. The evening of the operation her temperature suddenly rose to 104.6°, falling to normal in four days. The rise in temperature was of course too sudden and too great to be the result of the operation. The cause of it was soon discovered to be a marked intestinal disorder which had begun the day before the operation: this fact was not communicated to me by her mother. No drainage was used, and the wound was entirely well and the stitches out in five days. Her progress is very much the same as in Case I.

Case III.—J. L. H., male, aged sixteen months. Was first seen by me on January 10, 1891. In the fifth month of her pregnancy his mother's friendly sympathies were deeply stirred by seeing the dead baby of a friend, and in the seventh month of her pregnancy she was startled by being nearly run over. Her labor was normal, lasting three hours; no instruments were used. The child's weight was between seven and eight pounds. The anterior fontanelle was very small at birth, and closed at or before seven months of age. The child was breast-fed for three weeks, and afterward bottle-fed. At about three weeks, six weeks, and three months of age he had one or more convulsions. He was very peevish and fretful up to twelve months of age, but of late has been much less so until some recent trouble, presumably his teeth. His parents state that he was a "blue baby" for a year, but Dr. S. Striker, his physician, informs me that it was not discoloration due to a patent foramen ovale, but a constant and very marked mottling of the skin from defective circulation. The child has had attacks of very poor circulation, but of late these have diminished very much. He has also been subject to attacks of apparent pain and of restlessness continuing for a day or two.

Status præsens, January 10, 1891.—A well-nourished, apparently hearty boy; no contracture or other deformity excepting his head Viewed in front the skull is markedly conical, face broad, top of skull narrow and arching. Circumference on the shaven scalp, 38 cm. (15 in.). Diameters: Occipito-frontal, 13.5 cm. ($5\frac{5}{16}$ in.); biparietal, 9.8 cm. ($3\frac{7}{8}$ in.); bitemporal, 8.6 cm. ($3\frac{7}{16}$ in.). The child drools all the time, has never attempted to stand, falls unless held up, and scarcely even holds his head up. He has never talked. He moves his extremities, but very sluggishly; moans a little, sleeps poorly; head and eyes commonly turned to the left and upward, except in the attacks of apparent pain, when they go to the right, and, as his father expresses it, "he twists himself all up." These attacks are not epileptic in character. He yawns often. His attention can be attracted, but with difficulty, and only for a moment. On shaving the head the broad furrow behind the coronal suture is very marked and the occiput protrudes posteriorly much more than usual.

FIG. 1.



Operation, January 16*th*.—Present: Drs. Striker, J. C. DaCosta and Mills. Dr. W. J. Taylor, as usual, assisted me. I thought that the child's circulation had at times been so impaired that especial care was necessary in administering the anæsthetic, so I requested Dr. Coplin to give the ether, on account of his large experience in the Jefferson College Hospital. After the same method as in my former cases I cut a groove three-quarters of an inch to the left of the middle line, reaching from three-quarters of an inch above the supra-orbital ridge well back, nearly to the inion. Its length was six and three eighths inches. In biting the bone I used a pair of forceps devised by me for the purpose, which answered admirably, so that instead of an hour and a quarter, as in my first case, and fifty minutes in my second, I did the operation in thirty minutes. The bone bled quite freely but not alarmingly, and the bleeding stopped spontaneously. No other incident occurred during the operation except that the child's breathing at one time was sighing and he had apparently about the same time a slight convulsion. There was tremor of the extremities during the operation. At no time was he deeply anæsthetized. Shortly after the close of the operation I left the child in its crib in charge of a competent nurse and the mother. He was slightly pallid, but no more so than one would expect after an operation, and there was nothing in the respiration or pulse to cause anxiety. Dr. Taylor did not leave the house till an hour after the operation, when the child's pulse and respiration were entirely satisfactory. An hour and a quarter after the close of the operation the child gave a few gasps and died instantly, presumably from heart-failure. It had not recovered consciousness after the operation. No post-mortem examination could be obtained in spite of the most earnest efforts.

CASE IV. (Gerster and Sachs).—A. F., female, aged four and a half years; labor normal; first child; began to walk after the age of two years; in third year began to speak a few words; but these she would use properly. When thirteen months old had measles. At fifteen months two distinct convulsive attacks without paralysis. Other convulsive attacks at the age of twenty-two months and at twenty-nine months; none since. After these attacks grew more idiotic; lost what little speech she had, became unruly, fretful and ill-tempered; slept little. The fontanelles had disappeared. The measurements taken on shaved head were: Circumference, 31 cm.; fronto-occipital, from root of nose over top of head to occipital prominence, 30 cm.; biauricular, 32½ cm. The child was operated under chloroform, the period of anæsthesia lasting not more than fifty minutes; linear craniotomy was done on the left side, from in front of the position of the coronal suture and beyond the lambdoidal suture. The opening in the skull was semicircular. The child's pulse was weak as soon as chloroform began to act; recovered nicely, however. Soon after operation was conscious, and pulse rallied. Without the further accident the child died suddenly three and a half hours after operation, from acute anæmia.

CASE V.—In the *New York Med. Record*, Feb. 21, 1891, Dr. John A. Wyeth reports a case of a male child, eleven months old, operated on by a median incision of the scalp from the nose to the occiput. Two lateral trenches, one-fourth of an inch wide and three-fourths of an inch apart, were made from just above the eyes to the occipital protuberance. At each end a transverse cut was made in the bone on each side and a similar transverse cut on each side at the middle. By the fingers these four bone flaps were then forcibly torn loose from the dura mater, widening the trenches from one-fourth of an inch to one inch each. No injury seems to have been done to the dura. Time required, an hour and a half. Wound well without incident in ten days. A month later the improvement was "surprising and gratifying." The intelligence had greatly increased.

CASES VI. AND VII.—Two cases reported by Lannelongue in *L'Union Médicale*, July 8, 1890, and of which a *résumé* appears in my clinical lecture in *The Medical News* of Nov. 29, 1890.

CASE VIII. (Dr. J. C. McClintock's case.)—A girl, aged three years and eight months, though appearing to be not over one year of age. Premature birth at eight months; no instruments. Anterior fontanelle closed very early. Totally blind; not the faintest signs of intelligence. Two years ago the orbital plate of the frontal bone on the right side gave way, displacing the right eyeball from the orbit. The knee-joint became very painful a few months ago, and the arms and lower limbs contracted. Right tibia and fibula and left femur curved. Head narrow, forehead low. Linear craniotomy (March 28, 1891) on each side of the longitudinal sinus, with lateral grooves at the two ends. The tips of the fingers were then passed into the grooves, and the bones spread on each side until the quarter-inch groove became an inch wide. The dura was not opened. Next morning the temperature was 103° with rapid pulse, but soon subsided to normal. Entire union at the end of a week. The time is too brief as yet to judge of the result, but Dr. McClintock reports that the mother says that "since the operation the child is not so restless, does not cry nearly so much, and has required much less care and attention. The extremities are not so tender, and the child will try to play with any little article that is given to it." Before the operation she could only lie on one side; now she will lie on either side. The paralysis has almost disappeared, so that the left hand is used almost as readily as the right.

In considering these cases one is struck by the fact that two of them were followed by speedily fatal results. I presume it is only to be expected that children of such feeble cerebral development accompanied as in my own case (Case III.) with faulty circulation, should be less rugged and less able to stand the shock of an operation. The cause of death in my own case was very clearly, I think, heart-failure, and in Sach's and Gerster's case it was acute anæmia. This mortality, which is quite unusual, of course, in ordinary brain operations, should induce us to state the risk to the parents in stronger terms than we would were it an ordinary case of trephining. For myself I cannot but think it a very fortunate thing, for if such children cannot be helped it seems to me that death is preferable rather than to linger in this world in such a defective and helpless condition.

It should, however, make us especially careful as to the administration of the anæsthetic, and we should use all possible means to shorten the operation as much as possible. The forceps I devised for the operation certainly answer the purpose very much better than those I first used, so that the time required for the last operation was only twenty minutes, instead of an hour and a quarter as in my first. In using them it is better to cut alternately a little to the right and left (as one turns his toes out in walking) to prevent their binding. It will be noticed that the upper blade is perforated. This perforation widens from the cutting edge upward, so that each piece of bone bitten out pushes its predecessor loose. In a recent case of spinal laminectomy I used the same forceps to remove the vertebral laminæ, and I found them far superior to any of the other instruments I had on hand, and tried in turn.

I have not yet operated on both sides of the skull, and in view of our present experience I certainly would deprecate a simultaneous operation on both sides. Probably the additional shock would be very unwise and would add greatly to the mortality. Whether two lateral operations done successively will improve the condition of such children more than one remains to be seen.

The results as to mental condition in the six cases that have survived may be stated briefly as follows: Lannelongue's second case was reported almost immediately, too early to judge of any results. So, too, of

McClintock's case. In the other four children there can be no question of the improvement, very rapid in Lannelongue's case, slower but sure in both of my own and in Wyeth's case. We have therefore, I think, sufficient reason to encourage us to operate in other cases, and it is this fact and the fatal result in two which has led me to report my cases so early, before the final results are obtained. This will require several years, and meantime we ought to make known the immediate results as a guide in other cases.

In the *St. Louis Clinique of Physicians and Surgeons*, April and May, 1890, Dr. Louis Bauer reports the case of a young woman on whom he did a craniotomy for microcephalus. Her age, the measurements of the head and the date of the operation are not given. Two buttons were removed from the right parietal bone and the intervening bridge chiselled away. On May 9th, presumably 1890, a second operation was performed on the opposite side of the skull. Prior to operation there was spastic paresis of the muscles with great tremor, which after the first operation had so diminished as to enable the patient to thread a needle. There is no statement as to mental condition. She recovered from the second operation, but it is too early to judge definitely of results.

In *The Medical News* of Jan. 3, 1891, Dr. Trimble, of Baltimore, reports the case of a child, three years of age, whom he trephined on Nov. 8, 1890. On the right side of the middle line two buttons of bone, one inch in diameter and half an inch apart, were removed, so that the opening measured two and a half by one inch. Some improvement was noted on Dec. 6, 1890.

I have not included these cases under the head of linear craniotomy, since it seems to me that they should be considered simply cases of trephining for microcephalus and idiocy, as has previously been done by Fuller and others. The essential difference between trephining and linear craniotomy is this: that in linear craniotomy the intention is to make the entire side of the head a *bony flap*, as it were, whereas the trephining in the cases alluded to simply removed two buttons of bone and the intervening bridge and so produced a difference in pressure and possibly allowed, simply at the point of trephining, a little bulging of the brain itself. As to the results, so far as the brief time in all the cases will allow us to judge, they seem to be quite as good after trephining as after linear craniotomy proper, and if so, it may be a matter of indifference which is done. But at the present time it seems to me more logical to do the craniotomy than the simple trephining.

The operation of Wyeth seems to me unwise and likely to be followed by a fatal result in more cases than if the less heroic method usually employed is followed. Even this has resulted in two deaths already, and if a double operation is done and the two sides of the cranium are forcibly separated the danger would seem to me to be far greater. The dura might easily be torn, especially as it is so adherent in children. Moreover, the brain cannot suddenly follow the widening bone, but must be persuaded, as it were, to occupy a larger room by favoring its gradual growth. This, I think, is better obtained by the process I have followed than by Wyeth's method. The same remarks apply to McClintock's case.

EXCISION OF THE VERMIFORM APPENDIX BETWEEN THE ATTACKS IN A CASE OF CHRONIC APPENDICITIS; THE APPENDIX BEING FOUND IN AN ILEO-CÆCAL FOSSA.

By J. W. Elliot, M.D.,
of Boston.

On May 5, 1890, I saw the patient at Haverhill, Mass., in consultation with Drs. Clark and Young. She was a married woman, aged twenty-five, the mother of three children. She had always been subject to colics, and had been constipated all her life. Two years previously she had had an unusually severe colic with vomiting and pain, requiring morphia several times; from this time the attacks recurred every four to six weeks until October, when they began to come every three weeks, and morphia was usually required.

In February of this year she had a bad attack with a rise of temperature lasting a week; the pain began in the umbilicus and ran down to the right side. There were vomiting and chills, and a tumor appeared in the iliac region of the right side. Two weeks later there was another less severe attack with vomiting all day, and pain in the right side which required 1½ grains of morphia. From that time she had had pain in her right side almost continuously. On April 24th she had a sudden severe pain beginning in the umbilical region, and finally settling in the right iliac fossa. This attack lasted ten days. There was obstinate constipation, frequent vomiting, and a tumor in the right side. The temperature varied from 100° to 103°. Morphia was given freely for pain. It was during this attack that I first saw the patient, being called to operate May 4th. I was unable to go until the next day, when I found the patient so much improved in the twenty-four hours' delay that we decided that an immediate operation was unnecessary. I considered that an operation between the attacks was less dangerous than during an attack.

The patient caught eagerly at the idea of having the appendix removed between the attacks. We advised it for the following reasons: She had been practically disabled for a year, as any exertion or work was liable to bring on an attack; the attacks had become successively more severe; since February she had suffered constant pain and tenderness in the right side; the attacks had become so severe that the whole family were in a constant state of fear and anxiety; she had grown weak and nervous, and had lost flesh because she was unwilling to eat freely, thinking that food brought on the attacks.

On May 18th, she had another attack of pain, which was relieved by 1½ grains of morphia.

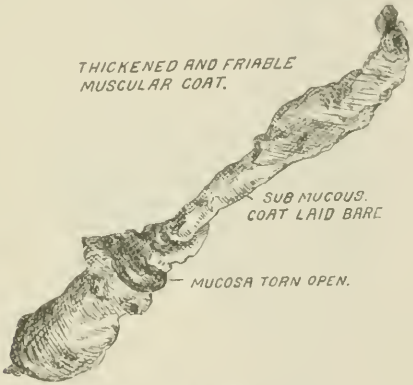
She soon came to Boston to be under my observation at a private hospital. On examination no tumor or resistance could be found in the right iliac fossa, only moderate tenderness. I soon found that any exertion on her part brought on pain and a slight rise of temperature, a short walk in the public garden nearly bringing on another attack.

The operation was done on May 28th. The incision was two inches long, and two fingers' breadth inside the anterior superior spine of the ilium. The cæcum presented; at first the appendix could not be seen, but after a careful search was found imbedded in adhesions, winding around under the cæcum in a fold of the peritoneum, which Treves describes as an ileo-cæcal fossa. The adhesions were separated with the finger and scissors. They were so firm that the muscular coat of the appendix was stripped off the inner submucous coat for a distance of half an inch. The appendix was also torn partly across in separating it. The operation was very difficult; the work required being much the same as in digging out old cases of salpingitis, except that more delicacy and care was required. It lasted one and a half hours. The appendix was ligatured at its base and removed. It was three inches in length, and the size of a lead-pencil with a bulb at the distal end. The muscular coat was thickened and friable. The peritoneal coat consisted entirely of torn adhesions.

Dr. Whitney, pathologist, reported as follows:

"The ends were both thickened, and on microscopic examination showed an increase of the muscular and submucous coats. There was also evidence of chronic peritonitis in the fibrous thickenings and enlarged bloodvessels. The mucous membrane was normal, and there was no evidence of round-cell infiltration. Chronic Appendicitis."

FIG. 1.


THICKENED AND FRIABLE MUSCULAR COAT.
SUB MUCOUS. COAT LAID BARE
MUCOSA TORN OPEN.

Chronic appendicitis.

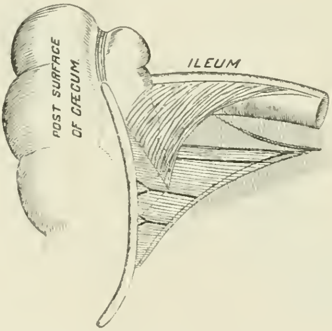
The patient made a good recovery. The temperature did not rise above 100°, and the wound healed by first intention.

It is now seven months since the operation. The patient has been entirely free from the attacks, and has gained 20 or 30 pounds in weight. She feels, and is, perfectly well.

Aside from the fact that there have been only a few cases reported of excision of the appendix between the attacks, the point of peculiar interest in this case is that the appendix was found firmly adherent in an ileo-cæcal fossa.

As these fossæ are not mentioned in the standard Anatomies of the day, and as this case suggests their importance in appendicitis, I will quote Treves's description as given in his Hunterian Lectures in 1885, published in the *British Medical Journal* of that year: "If the cæcum be turned upward so as to expose its posterior surface as it lies *in situ* (see Fig. 2), and if the appendix be drawn down so as to put its mesentery on the stretch, a peculiar fold will be found to join the mesentery. This fold, which may be of considerable dimensions, arises from that border of the ileum that is most remote from the insertion of its mesentery. It then passes over the ileo-cæcal junction on its inferior aspect; is adherent to the cæcum, and finally joins the surface of the mesentery of the appendix." "For convenience of description, and until some name is devised, it may be called the bloodless fold. Between this fold and the appendix mesentery there is a fossa that is almost constant and is often very capacious. It will commonly lodge two fingers as far as the first joints. It opens outward, its apex is at the ileo-cæcal junction, and it is bounded on one side by the small intestine and on the other by the caput coli. To this conspicuous pouch may be applied the name of the *inferior ileo-cæcal fossa*."

FIG. 2.



Ileo-cæcal fossa. (TREVES.)

According to the same authority there are other fossæ in this region less constant than the one described. They are collectively known as the ileo-cæcal fossæ. They have attracted the attention of certain anatomists, and notably of Luschka, Hartmann, Freitz, and Waldeyer.

Whether the incarceration of the appendix in these fossæ will be found to be a cause of appendicitis I cannot say. It is certainly very suggestive that this patient has had colics all her life, which seemed to her similar to the later and more severe attacks.

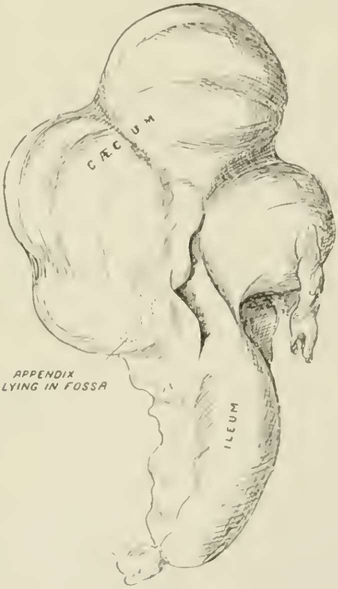
These fossæ surely deserve attention in connection with the operation; it was only owing to the fortunate chance of having seen an appendix in an ileo-cæcal fossa in a dissecting-room case ten days before the operation that I was prepared to understand the situation in this case.

By courtesy of Dr. Whitney I have examined forty normal cases in the pathological laboratory of the Harvard Medical School, and have found in fifteen of these cases ileo-cæcal fossæ so placed, and of sufficient depth, as to make a convenient resting-place for the appendix.

My friend Dr. Mixter found the above mentioned dissecting-room case —where the appendix was actually lying in an ileo-cæcal fossa differing only slightly from the one described by Treves. (See Fig. 3). In this case the appendix was with some slight difficulty removed from its resting-place.

The possibility of intestine being caught in an ileo-cæcal fossa has been suggested, but the case here reported is the first instance, so far as I know, where an operator has found the appendix there.

Fig. 3.



Appendix lying in peritoneal fold.

In such a case as this, where the appendix is difficult to find, I have found it a most useful rule in operating to trace the first longitudinal band of the colon that comes into view, down over the cæcum; it will surely lead to the appendix, as all these bands end in the appendix.

It is too early to try to lay down the indications for the removal of the appendix between the attacks, but as such recurring attacks are not usually dangerous, it is easy to foresee that the operation will be indicated principally in cases of invalidism. What degree of invalidism will call for the operation should depend largely on the mortality of the operator (unskilled operators should never attempt it), and on the circumstances of the patient, as poor people cannot afford to remain chronic invalids. Each case will require careful consideration and good judgment. The results so far have been brilliant.

The most formidable objection which has been raised against the operation is that in old chronic cases the appendix will often be found so firmly adherent to the surrounding parts as to make its removal impossible or very dangerous. From my experience I believe that the technique of this operation will easily be mastered; that the difficulties are much the same as in old cases of salpingitis, and that the same good results will be obtained, so that appendices which seem hopelessly snarled will be easily and safely removed. Certainly the case here reported is an example of how little constitutional disturbance follows an extensive dissection of a very adherent appendix.

THE CHEMISTRY AND CLINICAL VALUE OF STERILIZED MILK.

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CLINICAL LECTURER ON OBSTETRICS IN THE JEFFERSON MEDICAL COLLEGE, ETC.

I.

Proteids of Cows' Milk. By Albert R. Leeds.

INTRODUCTORY.

A great deal has been written of late years upon cows' milk as a culture medium of bacteria, and the dangers of transmission of infection by means of milk derived from diseased animals, or improperly handled or exposed, have been largely dwelt upon. As a consequence, sterilization has been looked upon as a necessity, if infants artificially nourished are to be protected from these perils. But the milk after sterilization has been found to be in some wise so changed that of late a reaction has set in, and the question has arisen whether or not the desired immunity could not be better attained by some other means.

The present research is in part directed to a statement of the changes effected by sterilization which are revealed by analysis, and in part to showing that the clinical evidence points in the same direction as that derived from chemical investigation. Both go to show the importance of an advance and improvement, and indicate the direction in which this improvement lies. It is in getting rid of the bacteria without injuriously affecting the digestibility of the milk. Enough has been done to show that this desideratum is possible of realization. It is possible, because a temperature below that at which the injurious changes occur is high enough to destroy nearly if not quite all the bacteria. At the same time this temperature is high enough to effect whatever beneficial changes are desirable in the modification of cows' milk, by peptonization or otherwise.

In the sections which follow, the results of an examination of the work of other authors bearing upon this subject are first given, and then the results and conclusions arrived at by the writer.

1. *Upon the three varieties of casein found in milk by E. Duclaux.*[1]

According to the first communication of this author, there is not simply one variety of casein in milk. Besides solid casein, which is seen to fall to the bottom of the vessel on the milk standing (in one case representing 0.4 per cent. of all the casein), there is casein in a colloidal state, passing through all paper filters but unable to pass through a filter of baked porcelain. After filtration through porcelain, the filtrate, containing, according to Duclaux, no casein, gives a precipitate upon the application of heat (albumin). After filtering off this precipitate, the subacetate of lead and Millon's reagent throws down a third albuminoid substance which is the lactoprotein of Millon and Comaille.

He states that if the material arrested by the filter be removed and suspended in water, it will nearly all dissolve (three-fourths of it in the course of three years), and that it dissolves as lactoprotein, or at least with all the characteristics of lactoprotein. Simply suspending the casein in water serves to bring about the appearance of all those materials which have been met with and sought for as affording characteristic reactions in milk. All these are presented, the casein passing from one to another by insensible transitions, but tending more and more toward those which are perfectly soluble. This is stated to be especially perceptible when the casein is suspended in water which is slightly acid or alkaline. He concludes by stating that casein seems to be a plastic substance modifying itself in an acid, alkaline, or neutral medium and dissolving in variable quantities, varying with the time and also the composition of the liquid. And hence, if the reaction of the liquid be changed from an acid to an alkaline, or *vice versa*, or any substance be added, a precipitate may occur, and thus be originated the numerous bodies which have been extracted from milk.

In a later communication (*ibid.*, vol. xcviii. p. 438), Duclaux claims for his procedure with a porcelain filter the merit of a new method for the analysis of milk. He regards the determination of albumin and lactoprotein as vain and illusory, and that the important matter is to separate and determine the casein only. The casein, according to this second communication, exists in three forms:

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[1] Sur les Matières Albuminoids du Lait. E. Duclaux. Comptes-rendus de l'Académie des Sciences, vol. xcviii., 1884, p. 373

First. Dissolved casein.

Second. Casein in suspension.

Third. Casein in a colloidal condition.

He restricts himself to the determination of the dissolved casein only, because he regards this dissolved casein as "the final form toward which the two other forms tend, and because its variations exhibit all the transformations which milk undergoes, whether in industrial use or in alimentation."

By the porcelain filter he arrests the elements "in suspension, viz., the fat, the two last varieties of casein, and also a part of the phosphate of lime," whilst the elements "in true solution" pass through the filter; viz., the milk sugar, the remainder of the phosphate of lime, and the other mineral salts.

Heat, Duclaux goes on to state, influences the casein but little, giving to the suspended casein cohesiveness and changing it from a mucous state to one more condensed, which is seen from the deposit on the tube of porcelain after filtration. In boiled milk this deposit is always more resistant and less voluminous than in raw milk. Slight acidity causes a small portion to pass from the colloidal into the solid state, while a slight alkalinity sends a portion of the solid into the colloidal condition, but neither of these influences sensibly change the proportions of the dissolved casein. The same may be said to be true of pressure. Hence the quantity of dissolved casein in a sample of milk is very stable, and what is more, is seemingly independent of the nature of the milk. Duclaux states that he found nearly the same proportion in cows' milk from different sources, and in goats' milk, asses', and human. Also that there are two influences which augment the quantity of casein in solution, viz.:

First. The addition of water; this, however, is but slightly active.

Second. The intervention of a diastase ("casease").

The latter is the more powerful influence, and this casease is prepared by introducing the microbes which produce it, and which act in a manner similar to a pancreatic ferment.

I have repeated the experiments of Duclaux, the especial interest of which lies in the character and quantities of the substances separated out by the porcelain filter, and while my experiments accord with his in respect of the great changes in the composition of the filtered milk thus obtained, yet there are important, and as it appears to me, very significant discrepancies.

Duclaux obtained:

	"In suspension."	"In solution."
Fats	3.32 per cent.	....
Milk-sugar	....	4.98 per cent.
Casein	3.31 per cent.	0.84 " "
Calcium phosphate	0.22 " "	0·14 " "
Soluble salts	....	0.39 " "
	6.85 per cent.	6.35 per cent.

In my own experiments a new Chamberland-Pasteur filter was employed, the milk being placed in a glass tube eight feet in height and in a funnel reservoir at its top. The funnel was plugged with cotton-wool to exclude atmospheric microörganisms. After three hours not a drop had come through, and aspiration was found requisite. The reaction of the filtrate was feebly acid, but not more so than the milk before filtration. Its specific gravity was 1.021 at 15° C., while that of the original milk was 1.033. The results were:

	Raw milk.	Filtrate.	Residue.
Fats	2.18	None	2.18
Milk-sugar	4.749	4.291	0.458
Casein	2.96	None	2.96
Proteids other than casein ("lactalbumin?")	0.69	0.085	0.605
Ash	0.751	0.414	0·337
Total solids	11.330	4.790	6.540

The first important difference is that a portion of the milk-sugar is arrested, 10 per cent. of the total amount remaining in the residue.

The next is in regard to the casein. The substance termed casein, in my analysis, is the proteid precipitable by dilute acid. In the raw milk the total proteids were determined according to Ritthausen, the casein by dilute acid, and the other proteids as the difference. In the filtrate the total proteids were found by determining the nitrogen and multiplying by 6.45. Dilute acid produced no precipitate and hence casein is put down as entirely absent. It is noteworthy that while the proteids as found in the filtrate by the above method were 0.119 per cent., their amount as determined by precipitation with alcohol was 0.0848 per cent. These other proteids had the deportment of "lactalbumin," and are so reported.

According, then, to my experiment, 2.96 per cent. or all the casein was taken out by the porcelain filter, and also 0.571 per cent. (or 83 per cent. of its total quantity) of the lactalbumin.

It is still a matter of debate as to the form in which the casein exists in milk, many regarding it as in part suspended and in part dissolved, whilst Duclaux adds a third condition—the colloidal. Certain it is that the porcelain removed it all.

But there has never been any question as to the condition of the lactalbumin, all holding it to be in a state of solution. Nevertheless, the filter, assisted by the dense coating originated during the process of filtration, has removed 83 per cent. of this dissolved substance.

The phosphoric anhydride in the solution was 0.085 per cent., corresponding to tribasic calcium phosphate 0.185 per cent., if we grant that it is in this form that the phosphoric acid is combined.

The preceding experiments left quite undecided some questions arising from the statements of Duclaux:

In the first place, the statement that in the course of time nearly all the casein redissolves, and that this redissolved casein is filterable through the porcelain, and that the filtrate presents all the characteristics of lactoprotein. "The mere placing of the casein in suspension in water is sufficient to provoke the appearance in the liquid of all the series of materials which people have encountered in milk and to which they have endeavored to ascribe distinctive characters. All the terms of this series are present in the beginning, the casein passes from one to the other by insensible transitions, but it tends more and more toward those which correspond to a state of perfect solubility."

Later on, where he speaks of casein as a plastic substance. Duclaux objects to giving different names to the various precipitates obtained from milk, regarding the determination of the percentage of dissolved casein as the only point necessary, and that all the other soluble proteids in milk are simply in a condition of transition towards this state of dissolved casein.

If these suppositions are correct, then on washing the residue left by filtration on the exterior of the filter by passing a sufficient volume of wash-water through it, removing it from the filter, diffusing it in water, dissolving, as far as possible, the soluble from the fatty and other matters and again filtering, the filtrate should present the characters of casein, and not of lactalbumin or other soluble proteid.

The results of this treatment were as follows:

	Raw milk.	First residue.	First filtrate.	Second residue.	Second filtrate.
Casein	2.47	3.19	....	3.1474	....
Other proteids . .	0.94	....	0.22	....	0.043
Fats	4.39	3.568	5.101	....	....
Milk-sugar . . .	4.279				
Phosphoric anhydride	0.223	0.084	0.139	....	..... .
Calcium phosphate (calculated) . .	0.487	0.183	0.303	....	....
Ash	0.751	0.112	0.639	.. ....	....
Total solids . .	12.83	6.87	5.96	....	1.04

It will be seen that the statements of Duclaux are not borne out by the analytical results. Nearly all the proteids were arrested by the first filtration, including all the casein and all the other proteids, except the small amount of the truly soluble proteid which carried the ferment (0.22 per cent.). And on the second filtration no casein was present in the filtrate, but as in the first instance was all arrested by the filter. The still smaller amount of the truly soluble proteid which passes through (0.043 per cent.) was, in all probability, the minute amount left in the first residue of total casein and lactalbumin and not removed from them by washing.

The conclusions which may fairly be drawn from these results are:

First, that whatever is the condition of the casein (and the reactions are most in accordance with the supposition that it is present as an alkaline caseinate), it is held in the milk in a colloidal state, and can therefore be filtered out on a porcelain filter. Furthermore, that the lactalbumin is likewise held in the milk in a colloidal state, and is filtered out along with the casein. But the starch-liquefying ferment, the "galactozymase," is in a state of true solution and passes through the filter.

The milk-sugar reported as being present in the residue is simply that part which is detained in the dense skin or coating of proteids and fats, and not removable by washing. A separate experiment was made with a milk-sugar solution filtered through a new Pasteur filter. It was found that the filtrate contained precisely the same percentage of dissolved milk-sugar as the original solution, showing that there was no stoppage of this truly dissolved substance owing to the magnitude of its molecules and the fineness of the pores of the filter.

Nearly as much of the phosphates present are retained on the filter as pass through, and they constitute nearly, if not all, the mineral residue in the former case. Indeed, if calculated as tribasic calcium phosphate, the amount would much exceed the total ash of the residue on the filter. That they do not exist in this form is evident, but in what condition of partial saturation has not been determined. In this connection the influence of lime upon the precipitation (or coagulation?) effected by rennet is noteworthy, and the relation which the phosphoric acid bears to the casein molecule.

2. *The casein obtained by the action of rennet and the casein obtained by the action of dilute acid.*

In a recent communication by Prof. W. D. Haliburton,[1] the proteid which is present in the milk is termed caseinogen, and that which composes the curd found under the ferment action of rennet is termed casein. And still further, the casein-producing substance (or caseinogen) is not only called caseinogen while it stands for the proteid as it exists in milk, but after it has been precipitated out of solution by the action of a dilute acid, like acetic acid.

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[1] "The Proteids of Milk," Journal of Physiology, xi. p. 449.

This nomenclature appears to be based upon the interpretation given by Hammersten to the results which he obtained while studying the action of rennet, and from which he concluded that the rennet acting as a ferment produced two substances neither of which exist preformed in the milk. One of these is the insoluble part, the curd, called above casein, the other a soluble proteid, called by Haliburton whey-proteid.

In other words, caseinogen plus rennet produces casein plus whey-proteid, and caseinogen plus acetic acid produces caseinogen plus acetate of — ?

According to Hammersten the above casein (from rennet) differs from the casein produced by acid by its lesser solvent power upon calcium phosphate, and especially by its no longer having the property of coagulating under the influence of rennet. According to Haliburton, in order to restore to casein produced by acid (his caseinogen) the casein-producing property, it must be re-dissolved in an alkali, preferably lime, then phosphoric acid added in order to form the necessary amount of calcium phosphate, and so finally rendered coagulable by rennet. Only after this manipulation does it give the insoluble curd and the soluble whey-proteid.

I find it very difficult to draw the inferences above stated from the observed facts. That both alkaline substances and phosphoric acid play an essential part in the phenomena is admitted. But no one, so far as I am aware of, has traced out the effect of these mineral salts satisfactorily, nor shown what manner of combinations they form with a proteid (probably a complex organic acid) like that we are dealing with.

The hypothesis at present most generally entertained is, that the casein exists in combination with the alkali only, and that on forming with the aid of the dilute acetic acid an alkaline acetate, the casein is set free. But this reaction and the difficulty of identifying the casein such as it exists in milk with alkali-albuminate in all respects, are both reconcilable with the possibility of the existence in milk itself of a complex compound of the casein-producing substance and the mineral substances present.

When rennet is used the casein-producing substance is in part precipitated along with some of the phosphoric acid and mineral constituents, and another part remains in solution associated with the remainder of the phosphoric acid and mineral salts. And until these two portions, the insoluble and the soluble, are obtained free from the mineral salts accompanying them, it would appear to me to be premature to state that the proteid precipitated by rennet is in itself different from the proteid precipitated by dilute acid. And furthermore, until the influence of these mineral constituents is allowed for, that it is premature to state that rennet acts as a ferment in such wise as to form two new proteids, an insoluble and a soluble, neither of which existed preformed in the milk.

These difficulties were not lessened by my own experimental results. On coagulating some milk with rennet, and examining both curd and whey, I found :

	Raw milk.	Curd.	Whey.
Proteids precipitated by acid	2.47	2.41	....
" non-precipitable by acid	0.94	.....	......
Total proteids	3.41	2.41	1.00
Phosphoric anhydride	0.223	0.102	0.121
Calculated as tricalcic phosphate	0.486	0.222	0.264
Ash	0.751	0.247	0.504

From which result it would appear that the proteid precipitable by acid (casein), and that non-precipitated (lactalbumin) in the raw milk are respectively the same as the total proteids in the curd or casein produced by rennet and in the whey. If a new soluble proteid (the whey-proteid) is produced by the action of rennet, then I should have anticipated that the total soluble proteids in the whey would have been materially increased. But this is not the case.

Furthermore, both the curd and the whey contain about the same amount of phosphoric acid, and this and the other mineral bodies remain in each to modify profoundly their deportment with the reagents used as tests.

3. *Upon the three varieties of proteids present in cows' milk, according to A. Béchamp, and upon the phenomena of coagulation.*[1]

This author discusses and objects to the many distinct phenomena which chemists describe under the one term coagulation. In this article he applies the term to the production of proteid precipitates insoluble in water, by means of alcohol and by heat. And on the supposition that the casein in cow's milk exists as an alkali-albuminate from which the coagulum is thrown down simply by displacing the alkali with the aid of an acid, he speaks of precipitating the casein, not of coagulating it. His experiments are directed to showing, moreover, that casein is a soluble substance and that it is not coagulable.

He finds that besides casein there are two other proteids present in milk, one of which is coagulable by alcohol (lactalbumin), while the other is not (galactozymase). Both are coagulable by heat, and are rendered by it insoluble in their natural solvents (by which he refers more especially to water).

The procedure followed by Béchamp is as follows: To prepare pure casein he adds to the fresh milk, in the cold, acetic acid drop by drop, until the liquid plainly turns litmus paper the color of onion-skin, at which point the dicaseinate first formed is completely decomposed. Soon after, the milk is curdled. The whey filters clear, whilst the casein in precipitating brings down the "milk globules" and "microzymes." The precipitate is then washed to free it from all the soluble matters, and after draining, its fat is extracted with ether. Then, after being again washed with water, it is diffused through a volume of water equal to that of the milk originally taken, and which has been rendered distinctly alkaline with ammonium sesquicarbonate. The precipitate dissolves, but the solution becomes turbid from the débris of the globule envelopes and from the microzymes. The casein is then precipitated by adding just sufficient acetic acid, and washed with water. If it is pure, the wash-waters are not rendered turbid either by ebullition or by the addition of alcohol. If they are, it is necessary to re-dissolve and re-precipitate, etc. By prolonged washing the casein is obtained in a pure condition, always presenting the same characters.

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[1] Bull. Soc. Chim., No. 3, 3d series, vol. iv. pp. 181 et seq.

It dissolves slowly and in small amount at common temperatures, a litre of water dissolving during fifty-two hours 1.005 grammes. It melts at higher temperatures and its solubility increases, 2.37 grammes going into solution in a litre of water raised to ebullition.

It deports itself as a feeble acid which acetic acid precipitates from its solutions, as in milk (so Béchamp states, although it would appear from his earlier statements in this article, that it is with alkali-caseinate we have to do in milk, and not pure casein), on account of its relative insolubility. It is not coagulated by acid or heat. Its solutions redden litmus paper in the same manner as carbonic acid; but it can form with potassa, soda, ammonia, and lime, soluble acid caseinates which redden litmus and which carbonic acid does not precipitate. The caseinates of these bases form solutions which are not precipitated by alcohol and which are not coagulable by heat. At the boiling-point, however, a solution of calcium caseinate appears to coagulate, but on cooling the apparent coagulum dissolves. All these reactions distinguish casein from albumin.

The whey from the casein is coagulable by heat and the coagulum is at the same time insoluble in water and in ammonium sesquicarbonate. To the clear whey, alcohol of 95 per cent. is added as long as a precipitate forms, two volumes at least being required. The voluminous precipitate is freed from milk-sugar by means of alcohol of 80 per cent.; then drained, and before drying it is stirred into water and after an interval thrown upon a filter. Something dissolves which is precipitable by alcohol, and the washing is, therefore, continued until the wash-water gives no precipitate with alcohol.

The undissolved portion is dissolved by dilute solution of ammonium sesquicarbonate, leaving an insoluble residue of mineral matters. The ammoniacal solution, treated by acetic acid, forms a precipitate which when collected and washed with water represents *lactalbumin*.

The part precipitated by alcohol but soluble in water is *galactozymase*. When it has been freed from lactalbumin by repeated solutions and reprecipitations, it is completely soluble in water, and it can come to pass that alcohol will no longer precipitate it except on the addition of a trace of sodium or ammonium acetate. The galactozymase of cows' milk liquefies starch paste but without saccharification.

It is evident that lactalbumin exists in the whey in a soluble form. But on precipitation with alcohol it loses its solubility in water while remaining soluble in ammonium sesquicarbonate. If, however, it is diffused through water and heated to 100°, it contracts without softening and becomes insoluble, not only in ammonium sesquicarbonate but also in dilute ammonia.

Galactozymase is in no wise coagulable by alcohol, but yields solutions which heat coagulates whilst depriving them at the same time of their zymasic function.

The specific rotatory power of the aqueous solution of casein for sodium light is $(a)j = -117^\circ$; the rotatory and other definite properties of lactalbumin and galactozymase distinguish them absolutely both from casein and from albumin, and prove them to be sharply defined distinct chemical species.

Inasmuch as I have been attempting to discriminate between raw and heated milk by whatever processes appeared available, I have repeated the valuable work of Béchamp in this connection, and have obtained certain interesting results. The method was employed as a basis for analysis, the milk analyzed (A), being in part raised to boiling (B) and in part heated in a sterilizer for one hour at 100° (C).

	A	B.	C
Casein	3.370	3.559	3.653
Lactalbumin	0.428	0.534	0.366
Galactozymase	0.314	0.055	0.056
	4.112	4.148	4.075

The conclusions arrived at from these analyses are:

1. Raising the temperature of milk to the boiling-point, and still more the retaining of it in that condition for a lengthened period, as in sterilization, converts a considerable portion of the soluble into insoluble proteids.

2. The effect of heat is greatest upon the galactozymase, which is as much thrown out of solution by raising the milk to boiling as it is by keeping it at 100° for an hour.

3. By prolonged heat the lactalbumin is also partly thrown out of solution in the milk. I say milk, because I am speaking of what takes

place in presence of the saline and other constituents of milk, and not what may be true of the coagulability and insolubility of these proteids under other conditions.

4. If these analyses are correct, raw milk should possess the power of liquefying starch. Milk from which the casein is removed should have that power. Both whole milk and the milk deprived of casein should lose the power of liquefying starch merely on its temperature being raised to the boiling-point. These suppositions were confirmed by experiments narrated under a separate head.

5. By heating, the percentage of what is put down in analyses as casein is increased, the increase and the error being greater as the boiling is continued.

6. I have been unable to satisfy myself that the portion of the casein insoluble in ammonium carbonate represents the débris of the envelopes of the fat globules and the "microzymes." If so, and these envelopes exist, they must be of marvellous tenacity, since the weight of this portion amounted to only 0.02568 per cent.[1]

> "The theory of an envelope to the fat-globules in milk is persistent but difficult to maintain. Babcock's experiments on butter-making showed that churning cream above 85° F. merely reduced the size of the globules. The globules cannot renew their envelopes proportional to their size as they break up, yet they are not changed in properties, as they would be if the envelope has been destroyed by rupture.
>
> "Apart from the action of fat solvents on milk fat when in its normal condition, there is little to suggest the existence of an envelope. May not the apparent properties of an enveloped globule be equally well explained by the theory of a globule of fat suspended in a liquid of different constitution from pure water, somewhat ropy or mucilaginous, as milk apparently is, and therefore exhibiting different relations of surface tension with reference to the fat globule as compared with the relations held to the latter by pure water."

4. *Upon the starch-liquefying ferment in cows' milk and human milk.*

If it be true, as the conclusion set forth under the fourth head in the preceding article would intimate, that there is naturally present in untreated milk a starch-liquefying ferment, the result would be of much interest from its bearing upon infant nutrition.

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[1] On repeatedly shaking milk with bisulphide of carbon the latter separates out, carrying with it a white substance which imparts to the bisulphide layer at the bottom almost the appearance of barium sulphate precipitate. After many washings with water, this yielded after evaporation a percentage of nitrogen corresponding to 0.51 per cent. of the milk treated. It was thought that by osmose the bisulphide might extract the fat, leaving the envelopes of the fat globules intact. I do not consider the above as adding anything additional to the inadequate experimental evidence on which the existence of these hypothetical envelopes rests, and quote the following comments by Prof. Breneman upon this point. His description of the character of the fluid part of the milk, as "somewhat ropy or mucilaginous," I have quoted as aptly expressing a similar conception on my own part.

Inasmuch as changes might be produced in the milk by the processes and reagents employed, I experimented in the first place upon the limpid sterilized liquid obtained with the Pasteur filter, and which contained in all but 0.119 per cent. of proteid matter. The amount and energy of the ferment cannot be otherwise but small, for on treating a paste of one gramme of starch in 200 c.cm. of water with 5 c.cm. of this liquid, it required from three to six hours' digestion at 34.5° C. to render the starch entirely fluid. As such it ran readily through a filter, whereas before digestion with the ferment it was unfilterable.

On heating to 75° C. the ferment was destroyed, a white coagulum being formed, and the filtrate from the Pasteur filter being entirely without action on starch. The same results were obtained with 5 c.cm. of the original cows' milk. It liquefied the starch paste, but after heating to 75°, or still more readily on boiling, entirely lost this property.

The whey obtained from the milk by the action of rennet was also destitute of a ferment capable of liquefying starch. As a control experiment, the rennet itself was tested and likewise found to be without such action.

On throwing down the casein with dilute hydrochloric acid, the filtrate appeared to have a slight action on the starch.

Human milk behaved in the same manner as cow's milk, but appeared to act with somewhat greater energy. On heating to 75° C. it entirely lost its power of liquefying the starch.

The percentage of galactozymase it will be noted is quite comparable to that of the lactalbumin in the analysis previously given, being as 0.314 to 0.428 per cent. But the result of the repeated washings and the solution would all tend in this direction: that is, to raise the percentage of what is put down as galactozymase. In the same milk, after heating to boiling and at 100° C. for an hour, the same body is obtained by analysis though in much smaller amount, being only 0.055 per cent. It is doubtful if it is present at all, since these heated specimens had entirely lost the starch-liquefying property.

It is more probable that the correct amount of the galactozymase is more nearly represented by the small percentage of coagulable proteid obtained in the filtrate from the Pasteur filter, 0.119, and which possessed more strikingly the property of starch liquefaction than any other condition or derivative of the cow's milk experimented upon.

It is, therefore, to be inferred that there is in cows' milk, beside the casein and albumin existing in a colloidal condition, and which are removed by filtration through a porcelain filter, a third proteid which is soluble and dissolved in such a condition that it passes through the filter. This proteid appears to be the galactozymase, which already has been differentiated from lactalbumin on the ground of greater solubility and other properties.

5. *The behavior of raw and sterilized cows' milk with acid and rennet at 34.5° C.*

In the preceding comparison of raw and heated cows' milk, the tests and analyses were made upon the samples when cold. But it is evident that the natural physiological processes of digestion take place at a higher temperature, and that deductions based upon tests made in the cold might lead one quite astray in relation to the phenomena of nutrition. The milk was diluted with eight times its volume of water.

	Raw.	Sterilized one hour at 100° C.
0.2 per cent. hydrochloric acid.	No precipitation: merely a turbidity like dilute milk.	Similar to the raw, but more opaque (clots of albumin).
Rennet	Imperfect coagulation; opaque liquid and filtrate.	Similar to the raw; no curd separating, but slimy clots.

The experiments were then repeated on the raw and sterilized milk without dilution. After digestion with dilute acid and rennet for fifteen minutes they were cooled to 15° C., then diluted with eight times their volume of water and the precipitate, if possible, separated from the filtrate.

		Raw.	Sterilized one hour.
0.2 per cent. hydrochloric acid		Imperfect precipitation; turbid liquid and filtrate.	Similar to raw, but non-filterable; clots.
Rennet		Curdled at once. Curd, Whey: See analyses.	No curd separating; clots (separated albumin) as found in milk long heated to 100° C.
Rennet + 0.3 per ct. hydrochloric acid.	15 mins.	Same appearance as with HCl alone.	Same as raw.
	1 hour.	As above.	Same as raw.
	30 hours.	Some clots in clearing liquid.	Some clots; liquid opaque.

Preceding experiments repeated, but with 0.3 per cent. pepsin added. The curdling with rennet was done before dilution, the raw milk setting at once to a stiff jelly, the sterilized forming no jelly.

	Time.	Raw.	Sterilized
0.3 per ct. HCl + 0.3 per cent. pepsin.	15 mins.	Very similar to experiment with HCl alone.	Same as raw.
	30 mins.	Granular, from an incipient separation.	No change.
	1 hour.	Large flocks in turbid menstruum.	Beginning to granulate.
	1½ hrs.	As preceding, but menstruum clearing.	Some separation, flock beginning to form.
	30 hours.	Fine coagula at surface, liquid perfectly clear.	Similar to raw, but liquid not perfectly clear.

	Time.	Raw.	Sterilized.
Rennet + 0.3 per ct. HCl + 0.3 per cent. pepsin.	15 mins.	Curd rapidly dissolved; same as with gastric juice alone.	Coagula attacked, and finally like raw.
	30 mins.	Granular.	Unchanged.
	1 hour.	Flocks in turbid menstruum.	Unchanged, no flocks.
	1½ hrs.	Menstrum clearing.	Unchanged.
	30 hours.	Fine coagula on surface; liquid clear.	Coarse coagula on top; liquid turbid.

6. *Behavior of raw and sterilized milk with acid rennet, and artificial gastric juice at 43° C.*

Having noted the results obtained with acid alone and rennet alone, it was desirable to repeat them in connection with the peptic ferment, to determine the relative action of the reagents employed, and the relative digestibility in these media of the milk before and after sterilization. 25 c.c. of the milk was used and made up to 200 c.c., the solution containing 0.3 per cent. real hydrochloric acid. The experiments were first repeated with these materials alone and then afterwards with rennet, no pepsin being employed.

	Time.	Raw	Sterilized.
0.3 per ct. hydrochloric acid.	15 mins.	Translucent, the solids somewhat dissolving.	Same as raw.
	1 hour.	Same as above; no precipitation.	Same as raw.
	30 hours.	No further change.	Same as raw.
Rennet alone.	15 mins.	Imperfect coagulation; opaque and like the mixture of milk and water alone.	Similar to raw.
	1 hour.	Similar to above.	Similar to raw.
	30 hours.	Coagulated.	Slimy clots, not curd.

The milk employed in these experiments was carefully analyzed with the hope of determining the amount and nature of the changes. But inasmuch as the hydrochloric acid appeared not only to combine with and carry some of the casein into solution, but also to form with the casein imperfectly or not at all precipitated, a turbid non-filterable liquid, the analyses could not be proceeded with. The only quantitative result was that yielded by rennet. But even the curd formed by it could not be filtered from the dilute and turbid whey by means of ordinary filters. It was necessary to use a Pasteur filter. This separated all the proteids except that minute amount which appears to be persistently soluble, and did not give a true result as to those which were present in the curd and those which remained behind in the whey.

	Original milk.	Filter residue.	Filtrate
Casein	2.317	3.01	0.123
Other proteids	0.813		
Fats	4.12	4.65	3.07
Milk sugar	3.578		
Ash	0.772	0.254	0.518

7. *Artificial digestion of raw and sterilized cows' milk.*

An attempt was then made to determine quantitatively the amount of change effected in raw and sterilized milk, by operating upon portions of the same sample of milk before and after heating, with artificial gastric juice and with pancreatic extract.

25 c.c. of milk was used in each experiment, the peptic digestion being as previously stated. In the pancreatic the 25 c.c. was made up to 200 c.c. with water containing in solution 195 mgms. (3 grains) sodium bicarbonate and 65 mgms. (1 grain) pancreatin. After digestion for six hours at 43°, the liquids were allowed to stand over night and then filtered. The peptic products could be filtered in the ordinary manner, since the liquid portions were clear and limpid. But those from the pancreatin were not clear and were only filterable through porcelain.

The raw milk which was employed in the experiments was completely analyzed with a view of determining the condition of all the constituents in the product of digestion, but the research was beset with so many difficulties, that at present the only figures reported are those for the residues.

	Original milk.	Peptic digestion. Residue from		Pancreatic digestion. Residue from	
		Raw.	Sterilized.	Raw.	Sterilized.
Casein . . .	2.58	0.153	0.449	1.26	2.596
Other proteids .	0.84				
Total proteids .	3.42				
Fats . . .	2.26				
Milk-sugar . .	4.69				
Ash . . .	0.71				

The fat globules appeared to remain quite unaltered during the process of digestion, and this was true not only of the peptic, but of the pancreatic action, although in the latter the reaction of the menstruum was alkaline. Under the microscope in the latter case, no change could be discovered in the appearance of the fat globules, either as to size, form, or probable number. This remark is more especially true of the products from the raw milk, which exhibited but little else than the fat globules, the shreds of residual nitrogenous matter being relatively inconspicuous. The residue from the sterilized milk exhibited more undigested nitrogenous matter, and this adhered in many places to the fat globules, somewhat distorting their outlines with sharp angular indentations. But the phenomena were not in accordance with the supposition that the fat globules were originally encased in a membranous envelope. In one instance, at least, the nitrogenous residue was submitted for many hours to further digestion (the residue from the peptic action on raw milk) and no further solution occurred. Furthermore this particular residue, amounting to only 0.153 per cent., in all probability was suspended as insoluble matter in the original raw milk. It gave the reactions of nuclein. In the ordinary course of analysis it would be thrown down along with the precipitate produced by dilute acid, and would be included in the casein.

The residue from the sterilized milk was much greater in both the peptic and pancreatic digestion than that from the raw. With both varieties of milk the latter digestion gave greater residues than the peptic, but the amount of pancreatin employed was relatively less also. That the effect of sterilizing was greatly to retard the rate, and diminish the amount of digestion, was evident. The clinging of the undigested residues to the fat globules of the sterilized milk was also a prominent adverse factor.

8. *The temperature at which milk may practically be sterilized without diminishing its digestibility.*

From the fourth section of this article it is evident that if we would avoid the coagulation of the proteids and the destruction of the ferment, the heating of milk must not be carried above 75° C. If, now, it should prove that at or a little below this temperature the sterilization of milk is practically accomplished, a most important point would be gained.

Inasmuch as it is difficult, without more care than would be probably given in domestic use, to perform the sterilization at a certain fixed maximum temperature, and not exceed it with the resultant coagulation, it appeared desirable to keep well within this limit, and my own experiments were performed at 68° C. (155° F.).

It is evident, in the first place, that no milk having an acid reaction is in a proper condition to be heated, because of the effect of acidity upon coagulation. And, inasmuch as cows' milk as delivered to consumers has usually developed a notable acidity, the addition of the requisite amount of a suitable alkali is the first point to be considered. Now, in one experiment 150 c.c. of milk required 52½ mgms. of carbonate of sodium to neutralize, or 28 mgms. of lime. This would be equivalent to the addition of 2½ grains of sodium carbonate to a pint of milk, or 9½ grains of ordinary liquor calcis. Other experiments on fresh commercial milk sold in bottles gave similar results. On standing, exposed to air, the acidity developed at an accelerating speed, the sodium carbonate required at the end of three days being 900 mgms., instead of 52½, and 900 mgms. of lime. This is 425 mgms. of lime beyond what is the chemical equivalent of the soda, a result probably connected with the different deportment of the lactic, carbonic, and butyric acids produced in course of souring.

It is worthy of note that ordinary spring, well, lake, and river water is not neutral in reaction, but alkaline, from containing some dissolved carbonate of lime. Hence, the carrying of the reaction of the milk to a point of slight alkalinity is not objectionable, and tends to retain the caseinates in solution.

On making gelatin-peptone cultures 1 drop of the original milk first alluded to yielded 400 colonies of bacteria after five days' culture at common temperature, while the same milk rendered very feebly alkaline with lime yielded 250 colonies.

Another sample yielded per drop 43 colonies after four days, and 3500 colonies after six days. This milk, alkalinized by lime, gave 14 colonies in the four, and 211 colonies in the six days.

After heating for ten minutes in sterilizing flasks at 100° C., both the original and alkaline milk were practically sterile, developing from 1 to 4 colonies of bacteria per drop after five days' culture.

Raw milk, after heating at 68° for an hour, proving to be practically sterile (1 to 2 colonies per drop), the experiment was tried of keeping the temperature at 68° for six minutes, when the same result was obtained. On cooling and diffusing the cream which the heating had brought to the surface, the appearance and properties of the milk heated to this temperature in no wise noticeably differed from raw milk.

These encouraging results led to similar experiments upon milk peptonized in a manner now largely followed when used for infant nutrition, the preparation employed being Fairchild's peptogenic powder; the addition of cream was omitted. The quantity of milk and water which is required for one feeding was raised to 68° by two minutes' heating over a Bunsen burner and then allowed to stand at this temperature for four minutes; 1 drop and 5 drops gave on culture for five days no colonies. This milk, to which I have applied the name of "humanized," was sterile. In another experiment the milk, after humanizing as above, was halved and one portion quickly raised to point of ebullition, and then the lamp removed. After five days' culture, one drop of the former yielded 6 colonies, while the latter was sterile.

The flasks containing both preparations were plugged with cotton-wool and allowed to stand for a week at common temperature. At the end of this time both presented the same appearance, having a layer of cream at the surface, but with no appearance of souring or curdling, although to litmus the reaction was feebly acid.

The odor was agreeable, suggesting the presence of a trace of butyric ether, while the pink biuret reaction was very strong, showing not only the conversion of the casein into peptone, but the permanence of the albuminoids in a soluble, non-coagulated form, after heating to 68° and even 100° C., and after standing in the laboratory for seven days. Under the microscope some micrococci were found, but no bacilli.

A point of vital importance is the digestibility of the products after these products have been heated to temperatures of pancreatic digestion adequate to effect their sterilization. The former sections referred to the digestibility of milk after the milk itself had been heated and sterilized and then submitted to pancreatic digestion. This is an altogether different matter.

To study this question the milk used in the above experiments was analyzed before humanizing, and, as far as could be, afterward.

	Raw cows' milk.		The same humanized	
			at 68°.	at 100
Total proteids,	3.56 per ct.		3.56 per ct.	3.56 per ct.
Casein and nuclein,	2.59 per ct.		0.2269	Not determinable.
Lactalbumin and galactozymase,	0.97 per ct.	Soluble proteids and peptones,	3.334	" "

The difficultly digestible portion of the milk humanized at 68° was 6 per cent. of the total proteids, as against 70 per cent. before treatment. There was no difficulty in performing the analysis on the milk heated to 68°, but the analysis could not be executed on that which had been raised for an instant to the boiling-point. The latter contained very minute particles of a coagulated proteid (probably galactozymase), which passed through the pores of ordinary filters, and which persisted in the various steps of the attempted analysis.

From the foregoing it appears that raw milk, as commercially delivered—or still better, after being rendered slightly alkaline by lime-water—may be practically sterilized by heating for six minutes to a temperature of 155° F., while at the same time the lactalbumin and galactozymase do not undergo coagulation, and the digestibility of the milk is not injuriously affected. Also, that a still more advantageous method consists in sterilization and peptonization at the same time, the proteid matter of which the microörganisms are composed being digested away and their vitality destroyed.

Repetition of the Pancreatic Digestion.—After concluding the above experiments, it appeared desirable to repeat those with pancreatin, limiting the action of the ferment to one hour, and determining whether a greater percentage would undergo digestion by increasing the amount of pancreatin.

The raw milk used had a density of 1.03 at 18°, and contained 3.56 per cent. of total proteids.

A portion was heated to 100° for an hour in a sterilizer. In all the experiments 25 cubic centimetres were made up to 200 cubic centimetres with water and the following reagents:

A. Raw milk + 0.325 grammes (5 grains), pancreatin + 0.975 grammes, $NaHCO_3$.

B. Raw milk + 0.650 grammes, pancreatin + 1.95 grammes, $NaHCO_3$.

AS. Sterilized milk + 0.325 grammes, pancreatin + 0.975 grammes, $NaHCO_3$.

BS. Sterilized milk + 0.650 grammes, pancreatin + 1.95 grammes, $NaHCO_3$.

They were all heated for one hour in water-bath at 43° C. At the end of fifteen minutes A and B were not much altered, B beginning to show flocks. After half an hour A similar to B at fifteen minutes, and B flocks more separated and more translucent. After three-quarters of an hour flocks separated in A, and B showing a more translucent fluid portion than A.

AS and BS at the expiration of an hour were not flocculent, and did not appear noticeably more altered than in the prior experiments at the end of twenty-four hours, slimy clots only separating.

	Raw.		Sterilized.	
	A.	B.	AS.	BS.
	Per cent.	Per cent.	Per cent.	Per cent.
Total proteids	3.56	3.56	3.56	3.56
Total proteids in dissolved portion	4.366	5.59	4.327	5.385
Proteids in pancreatin used	1.214	2.428	1.214	2.428
Proteids of dissolved milk	3.152	3.162	3.113	2.957
Proteids of insoluble portion	0.408	0.398	0.447	0.603
Percentage of insoluble to total proteids of milk	11.5	11.2	12.6	16.9

These experiments confirm the foregoing, a certain constituent resisting digestion both in raw and sterilized milk, the amount being greater in the latter. The inability to digest this residual portion does not reside in the non-activity of the ferment, since its digestion is not brought about by doubling the amount of ferment, but depends upon the nature of this fraction (the nuclein in raw, the nuclein plus coagulated proteids in sterilized milk), which is not capable of undergoing solution under the influence of pancreatin.

Conclusions.—From the preceding discussion it would appear that there are three classes of substances which are present in normal cows' milk.

1st. Substances in suspension, including:

Nuclein, an organic compound containing phosphorus, the composition of which has not as yet been satisfactorily determined.

Fat globules, destitute of envelopes, and swimming in a colloidal ("somewhat ropy or mucilaginous") fluid, the physical characters of which are favorable to their persistence as separate globules under ordinary conditions of temperature and reaction.

2d. Substances present in a colloidal condition, including:

Casein and lactalbumin, the former of which appears to be in combination with alkali, and probably also with lime and phosphoric acid, and is precipitable by dilute acid.

3d. Substances present in solution, including:

A nitrogenous starch-liquefying ferment "galactozymase," milk-sugar, common salt, and certain soluble compounds of phosphoric acid.

The noted effects of sterilization are:

a. The starch-liquefying ferment is destroyed and coagulated. After coagulation the "galactozymase" is insoluble and is carried down with and included in the precipitate obtained on addition of dilute acid.

b. A portion of the lactalbumin as it exists along with the other substances present in milk, is coagulated. But this coagulation is only partial, even after long-continued heating. Its effect, however, is to thicken the milk and intensify its colloidal (ropy or mucilaginous) characters.

c. The casein is not coagulated by the heat, but is less readily coagulated by rennet, and yields slowly and imperfectly to the action of pepsin and pancreatin.

d. The fat globules themselves are somewhat affected by the heat, and after standing, lumps of butter-fat have sometimes been observed on the surface of the milk. But the coagulated proteid matters attach themselves to the fat globules and probably have an influence in bringing about that less perfect assimilation of fat which has been noted by various observers as true of infants nourished upon sterilized milk.

The milk-sugar by long-continued heating is completely destroyed, and is probably affected to a certain extent during the interval ordinarily allowed for sterilization.

Finally, sterilized milk is less readily and less perfectly digestible than raw milk, and if sterile milk is sought for, the present desideratum is to obtain it either directly from the animal, or by a process not accompanied by such serious drawbacks.

Such a process is believed to be the heating of the milk, after being rendered feebly alkaline with lime-water, to 155° F. for six minutes; or, still better, the treatment in alkaline solution with pancreatin at 155°, followed, if not used immediately, by momentary heating to the boiling-point.

II.

THE CLINICAL VALUE OF STERILIZED MILK.

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It is my purpose in these clinical notes to state in general terms the results of clinical observation and experience in the use of sterilized milk for infant feeding. It is quite evident to one who has thoughtfully considered the matter that the sterilization of milk, like the use of antiseptics, is rather an expedient than an ideal procedure. Whether the milk globule be a drop of fat enclosed in an albuminoid envelope, or whether it be simply a fat drop whose contour depends upon the menstruum which contains it, if this milk cell or unit could be conveyed to the child in a perfectly fresh and pure condition, the question of infant feeding would be that of chemistry only. It would be necessary then simply to make an artificial food, identical in its chemical constitution with the natural food of the infant. The success of the formulæ which aim to accomplish this end must remain undisputed so long as the milk employed is pure and fresh. When, however, we consider what an excellent culture medium for bacteria milk is, and under what favorable circumstances for contamination it is ordinarily produced and handled, it is evident that the preparation of milk in many cases for infant feeding becomes not simply a question of chemistry, but also a question of sterilization. A milk compound which may be absolutely correct from the standpoint of chemistry may yet be indigestible for an infant and disappointing as a food, if noxious bacteria gain access to such a mixture; hence the necessity for sterilization. A chemically perfect compound again may be indigestible from the character of the albumin in the individual globule of cows' milk, which is less digestible than in the human subject. Hence it is not to be wondered at that artificial ferments have been frequently employed to remedy this difficulty. The combination of peptonizing and sterilizing processes has been a natural experiment and, theoretically, a rational one. However the theory of sterilization may be elaborated, there remains the practical question as to whether infants fed upon sterilized milk are well nourished by that food. It is to give the results of observations upon this point that the writer adds this clinical note to the paper of Professor Leeds.

Some three years ago, during a summer service at the Philadelphia Hospital, the writer introduced sterilized milk as a food for infants. The milk ordinarily furnished to the hospital is subjected to a lactometer test before acceptance, and is of a commercially fair quality. Reasonable care is exercised in handling this milk, and it may be taken as rather better than the average milk obtained in summer in a large city. The sterilization was performed by the usual method, the bottles being corked with cotton, and the milk sterilizing for half an hour. The class of children to whom it was given affords an excellent opportunity to test the nutritive value of any food substance. Some were foundlings, the majority breast-fed children, oftentimes born of ill-nourished or diseased mothers whose milk was not proper food for their offspring. Sterilized milk was diluted in varying proportions, and was fed in quantities suitable to the age and development of the child. At the same time that this milk was introduced as a food, antisepsis was employed in the hygiene of the child and in the treatment of its digestive disorders. All possible cleanliness was observed about the infant; its diapers, after being washed, were wrung out in a dilute solution of bichloride of mercury. If diarrhœa supervened, the intestines were thoroughly irrigated with boiled water, a solution of sodium salicylate one grain to the ounce, or a dilute solution of thymol, or of some other antiseptic. If vomiting persisted, the stomach was irrigated in a similar manner. Drugs thought to be of value as intestinal antiseptics were given in cases where the presence of fermented food was suspected. A description of these procedures is given, although they do not pertain to methods of feeding, because their employment doubtless influenced the general result. It was found that so far as sterilization was concerned there was no difficulty in furnishing to infants a diluted milky fluid which was taken with comparative avidity. It was noticed also that acute enteritis subsided, and that few cases of sudden diarrhœa, or what is commonly known as "cholera infantum," occurred. In fact, no case occurred originally in the hospital during this time. It was soon observed, however, that although infants were exempt from symptoms of acute disease, yet that they remained ill-nourished, and many recovered from acute enteritis, for which they were brought to the hospital, only to succumb after two or three weeks from gradual starvation. Constipation, often severe, frequently followed the use of sterilized milk. Efforts were made in various ways to supply proper nourishment; milk was peptonized and pancreatized with the materials manufactured by Fairchild Brothers and Foster, and was then sterilized; and a fairly successful formula was that which combined milk, water, dried granular extract of malt, and a small percentage of bicarbonate of sodium. The result of this combination was a "malted milk" resembling chocolate containing an excess of milk, which was quite palatable and agreed with some of the infants. Animal broths, white of egg, flour-ball, various preparations of malt, barley water, alcohol, several of the patented foods in market, and cod-liver oil were all used in turn with individual cases. Of these adjuvants, cod-liver oil was most beneficial, especially when accompanied by the administration of Fowler's solution in small doses. It was the invariable experience, however, that sterilized milk, whether peptonized or not, resulted in but a temporary improvement in the nutrition of the infants. Where an infant was breast-fed, and several daily meals of a sterilized mixture combining milk, cream, sugar of milk, and lime-water were given, the artificial food seemed to be well borne, but when the sterile food was the only resource, the infant failed.

Every opportunity was taken to examine the bodies of children dying of starvation under the use of sterilized milk. A moderate degree of emaciation was present, the mucous membranes were anæmic, oftentimes slight serous effusions were observed, while the muscular tissues were pale and atrophied. The stomach was usually distended to a considerable degree, and its walls were excessively thinned. The intestinal tract showed no ulceration, nor was enteritis present. The mucous membrane was pale and excessively thin, and the condition of the entire digestive tract is best described as highly atrophic, with the distention resulting from paralysis. Upon examining the brain, passive congestion was observed, the congestion in the sinuses being found especially well marked in cases which had suffered from prolonged diarrhœa.

So far as the temperature of the atmosphere was concerned, sterilized milk seemed equally unsuccessful in winter and summer, and the conclusion reached has been that, as a food, the ordinary process of sterilization renders milk unfit for nourishment. In an ambulatory clinic at the Philadelphia Polyclinic, the writer furnished sterilized milk, prepared by trained nurses, to all infants whose mothers would use it. Many cases of acute diarrhœa, when visited by a nurse and given sterilized milk, speedily recovered, but in no instance was its prolonged use more successful than in the cases already described. The practical difficulties accompanying the effort to place sterilized milk in the hands of ignorant mothers can best be appreciated by those who have made the experiment. Among the children of well-to-do parents, the familiar formula calling for milk, cream, and sugar of milk to which, when sterilized is added lime-water, serves a useful purpose in many cases, but for prolonged use other expedients have been found necessary. It has been interesting at various times to observe the change in the condition of children, wasting away upon sterilized milk, who have been taken to an entirely different atmosphere and given fresh milk suitably diluted and unchanged by sterilization; an immediate improvement in nutrition has been seen to follow such a change in many instances.

Regarding the changes in the stools of infants fed upon sterilized milk, the reaction and color of the stools changed from alkaline to acid and from yellow to green, apparently without distinct connection with the constitution of the milk. As intestinal irrigation was practised extensively the composition of the stools was necessarily changed, and hence an accurate observation of the stools in these cases while under treatment was hardly possible.

A considerable improvement in the mortality and morbidity rate followed the introduction of the methods of treatment described. The writer was at first inclined to attribute this improvement largely to sterilized milk, but further observation leads him to believe that the careful antiseptic precautions which were taken in the child's hygiene, together with the prompt removal of fermenting material from the digestive tract, had quite as much to do with the improvement of the patients as the sterilization of milk. The fact remains that "cholera infantum"—acute gastro-enteritis—did not arise in the wards, and was rapidly subdued in patients admitted from without. As a means of nourishment, however, sterilized milk was of very limited utility.

With reference to the recommendation of Professor Leeds that sterilization be performed at a lower temperature than that which I have previously employed and for a shorter time, experiments are now in progress to test the practical value of this recommendation. It seems probable that many cases where milk is prepared by nurses and mothers who are not accurate as to the temperature employed or the time expended in sterilization, owe the success of sterilized milk as a food to such a process as is recommended.

The good results often obtained by mixing good milk with an alkaline solution and sugar of milk and then scalding or simmering the mixture probably depend upon the same grounds.

THE MICROSCOPICAL ANATOMY OF THE HUMAN HEART,

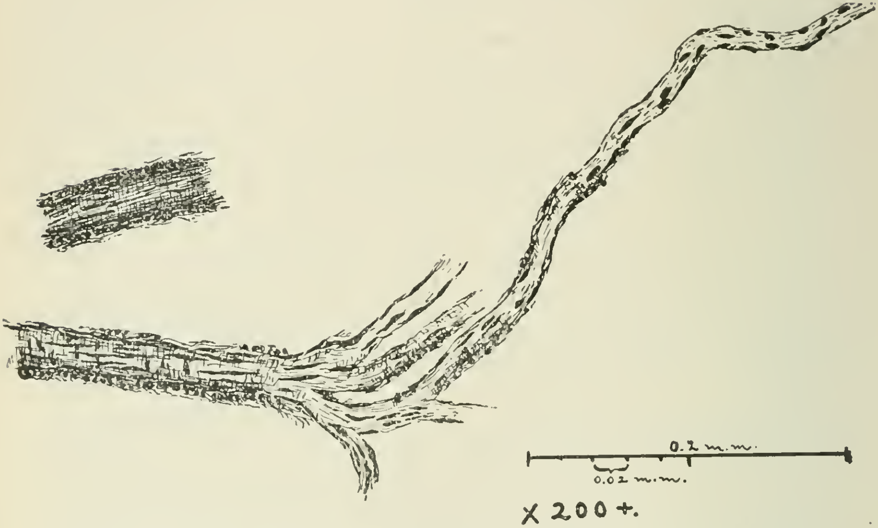
SHOWING THE EXISTENCE OF CAPILLARIES WITHIN THE MUSCULAR FIBRES.

By Arthur V. Meigs, M.D.,
PHYSICIAN TO THE PENNSYLVANIA AND CHILDREN'S HOSPITALS.

In the pursuit of pathological studies directed especially to the investigation of Bright's disease, vascular changes, and heart disease, and to the relations of these morbid processes one to another, I have examined a large number of human hearts. At the present time there are in my collection sections of forty-nine hearts, which are in most instances accompanied by full clinical histories of the patients. The causes of death included violence and many different diseases, and the ages ranged from an early embryological condition to three weeks after birth, and upward to old age. My studies have been carried on now during a number of years and it has impressed me, as of course it must everyone who attempts to investigate pathological changes, that the most important and difficult problem is to decide what particular appearances in a given tissue are histological and what pathological. One result of my labors has been to lead me to the observation of certain appearances of the normal microscopical structure of the heart which are, so far as I know, new, and which certainly are not commonly known either to histologists or pathologists. These appearances are connected with the condition both of the vascular supply and of the structure of the muscular fibres, and it will be impossible to describe the one without alluding to the other also, but so far as possible the arrangement of the blood-vessels will be dealt with first.

Upon the surface of the heart there are numerous arteries and veins of the ordinary structure, having three coats, the middle or muscular one having circular fibres. Though veins having three coats are always present on the surface of the heart, my studies have led me to the conclusion that they are rare in the muscular walls, where the three coats are found only in veins of large size, and the smaller ones have but a single coat. This single layer is composed of endothelium, and is in appearance and thickness precisely like the wall of the smallest capillary. On the other hand, the arteries can be seen to have three coats, the circular muscular fibres being distinctly visible, until the size of the vessel is little greater than that of the capillaries of least diameter. This process of transition from arteriole to capillary is one of great interest, and is accurately depicted in Fig. 1.

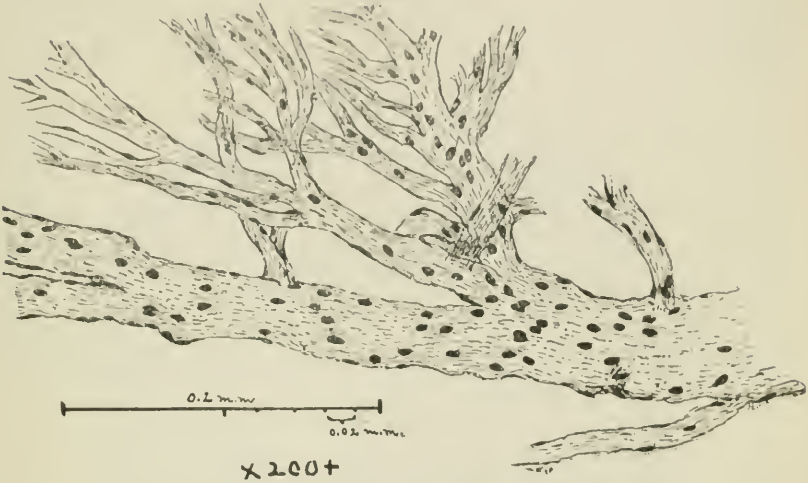
FIG 1.



Represents the transition of a minute arteriole into capillaries. It is seen that circular muscular fibres are scattered along the vessels even after they are of the smallest size, at last disappearing, and the capillary then being composed of endothelium alone. The angles formed at the points of division are acute.

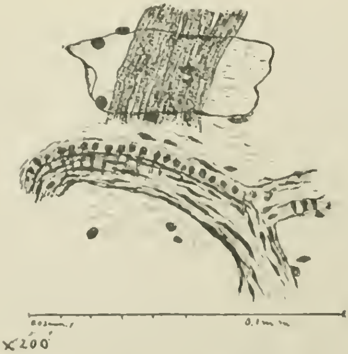
The mode of transition from arteriole to afferent capillary is in strong contrast with that of the efferent vessels. The condition of things will be better understood by examining Fig. 2, which admirably represents the ordinary appearances of the return vessels, than by any verbal description. The vessel into which the capillaries of the smallest size empty their contents is, as may be seen, one having walls no thicker than the smallest capillaries and of a structure precisely similar. The smaller capillaries, too, at their junction with the larger vessel often form much less acute angles than is usually the case at the points where the arterioles break up into afferent capillaries. The small efferent capillary even forms a right angle with the larger one, thus emptying its blood into a stream flowing directly at a right angle to its course up to its termination. Another striking point, and one worthy of note, is that these efferent capillaries seem much more numerous than the afferent ones, perfect showers of them emptying into the larger vessels within

Fig. 2.



A picture of the coming together of many capillaries of the smallest size to form one of the comparatively large efferent vessels which perform functions directly the opposite of those of such arterioles as that represented in Fig. 1. It is noticeable that the number of capillaries is very great, and that the angles formed are much less acute than at the subdivision of the arteriole, in some instances there being almost right angles. The vessel, too, is of fully twice the diameter of the arteriole.

Fig. 3.

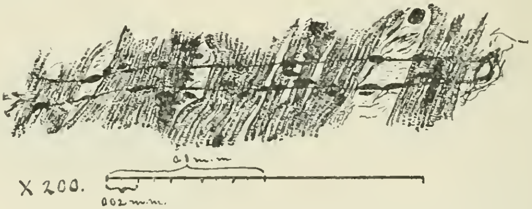


Shows a portion of an arteriole and its accompanying return vessel lying beside each other. The vein has a bit of muscular fibre lying over a portion of it, and at one end is folded. The fold shows how thin is the substance forming the wall. The accompanying arteriole is of only about half the diameter of the vein, and the circular muscular fibres cut across are very distinctly visible upon one side. The contrast in structure of the two vessels could not be made more plain than it is by this picture. The difference in size, too, of the two vessels is a most striking feature.

small areas, while at the points where the arterioles break up the number of capillaries is relatively much less. The large efferent vessels are of much greater diameter than the arterioles by which they are accompanied and with which they correspond, but whether this was the case during life or whether the vessels carrying blood out from the tissue are larger because they remained distended after death with blood, it is, of course, impossible to decide.

The usual condition of things, then, in the substance of the heart is that when parallel vessels, the one a carrier of venous and the other of arterial blood, are examined, the arteriole is found to have the structure commonly described as proper to vessels of that nature, being composed of three coats, while the venous vessel exhibits but one, and this coat presents an appearance identical with that of capillaries of the smallest size, being endothelium alone. The appearances described are fairly well represented in Fig. 3, and the nature of the material forming the vein is further made evident by the fact that at one end it was slightly folded.

FIG. 4.

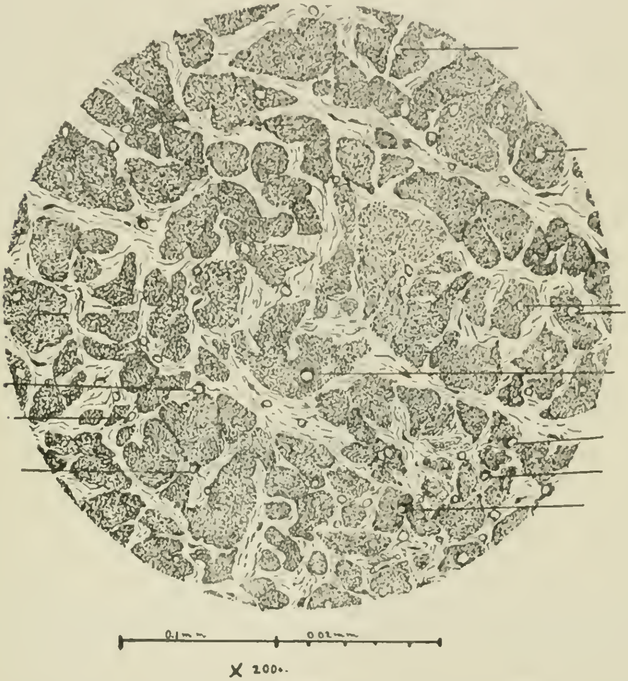


A drawing of a capillary running nearly at right angles to the muscular fibres it is crossing.

The important anatomical point to be made is that the *venæ comites* of arterioles in the walls of the heart are vessels having but a single coat.

The distribution of the capillaries in the muscular substance of the heart is well known up to a certain point; histologists thoroughly understand that the minuter arterioles have their termination in capillaries which, after ramifying among the muscular fibres, finally end in venous radicles to discharge the blood at last into the right auricle. To say, however, that the whole circuit of the vessels has been thoroughly traced out as has that of even the minutest capillaries in the liver and kidneys would not be true, for in the ordinary works upon the subject the matter is not pursued beyond the statement that the muscular fibres are richly supplied with capillaries. The capillaries run, of course, in all directions amongst the muscular fibres, parallel with and between them, at acute angles across them, and again often at right angles. The appearances presented in the last instance are well shown in Fig. 4, which represents a small capillary crossing muscular fibres at nearly a right angle. This describes the more ordinary conditions of the minute vessels of the heart as they have presented themselves to me, and it becomes necessary now to approach the second and still more important part of the subject, the appearance and structure of the muscular fibres in their more intimate relations with the smallest capillaries.

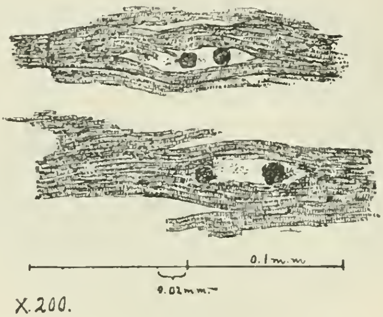
FIG. 5.



In this picture are seen primitive muscular fibres, with the intervening connective tissue and many capillaries cut across. It should be noted that the muscular fibres in cross sections do not generally appear as circles, as is commonly represented, but are very irregular in outline, though some are nearly circular. This must be due to the branching, or, as it is commonly called, anastomosing, of the fibres. The important feature, however, is the situation and appearance of the capillaries. It is easy to see that they lie in the connective tissue, are partially imbedded in the sides of the muscular fibres, or are even in their centres. The fact that they are capillaries is shown by the presence of the endothelial nuclei cut across in some of them, giving them the appearance of a seal ring seen from one side. This resemblance to a seal ring is very plain in a number of capillaries in the picture, and in a number of instances the capillaries can be seen in the very centres of muscular fibres. The most marked instance is that of the large capillary near the centre of the picture to which there is a pointer. The pointers draw attention to capillaries which exhibit the described characteristics in marked degree.

Sections in which the muscular fibres have been cut as nearly as possible directly across their length show the position and number of the smallest capillaries and their relation to the fibres in a more graphic and unmistakable manner than any others. Under these circumstances the vessels present themselves in the form of circles, or, if the section has been at all oblique, as ellipses. Those who have studied sections of bloodvessels will realize how vastly easier it is to draw conclusions in regard to their condition when transverse sections are under consideration than if they be longitudinal. The vessels being hollow cylinders, the variety of the appearances is infinitely less in the case of transverse sections, for then the pictures presented are always in the form either of a circle or an ellipse, and if it be an ellipse the difference between the longer and shorter diameters gives a knowledge of the degree of obliquity of the section. On the other hand, in the case of longitudinal sections, the variety of appearances that may be produced is almost infinite. It would be quite impossible to give any adequate description of these varying appearances, but the mere mention of their existence is sufficient to remind anyone who has given personal attention to investigation of the subject, of the truth of the statement, and of the further truth too, that under the best circumstances studies with the microscope of vessels in longitudinal section yield less satisfactory and less conclusive results than cross sections. Fig. 5 is a carefully made scale-drawing of a single field under the microscope of such a cross section, and it exhibits all the different appearances which it is desired to describe as existing in the heart when seen in that way. It is easy to recognize the vessels as they lie in the connective tissue, where they generally appear as minute circles, with walls of exceeding delicacy and of equal thickness around the entire circuit. There are a few, however, of the capillaries which exhibit upon one side much greater thickness of wall than elsewhere, reminding one of the appearance of a seal ring when looked at from the side. Such thicker spots are caused by the knife having

FIG. 6.



Represents two muscular fibres in longitudinal section which have large, elongated cavities in their centres. It is noticeable that in both instances there are two nuclei quite close together, and that they seem to lie in the spaces without attachment to anything.

cut through a nucleus in the endothelium of which the walls of the capillary are formed. A closer examination of the drawing, however, brings to light the fact that these empty circles are not to be seen in the connective tissue alone, but exist also half-imbedded in the sides of the muscular fibres and even entirely within them. When I first observed these circles lying within the muscular fibres, and, at their edges partially imbedded in them, I did not know what explanation to offer for their appearance. It seemed as if they must be capillaries, and yet the fact that they were closely surrounded by the darkly-stained muscular material made it at first impossible to determine that there was any endothelial wall separating the lumen from the encircling muscular fibre. Closer examination, however, brought to light the fact that in places endothelial nuclei could be distinctly seen (see Fig. 5), and study of a great number of sections from many different hearts showed that occasionally the endothelial wall could be seen in capillaries entirely imbedded in muscular fibres, thus forcing me to the belief not only that the capillaries enter the muscular fibres, but that they actually penetrate to their very centres.

In order to prove this conclusion to be correct it was necessary to find corresponding appearances in longitudinal sections. As has been stated, longitudinal sections do not yield such satisfactory results as transverse ones, and the appearances are much more difficult to interpret owing to the infinite variety of forms produced. Fig. 6 represents muscular fibres cut longitudinally, and there can be no doubt of the presence of cavities in the centres. The nuclei look as though they lie loosely in the spaces. It is curious, too, how frequently the appearance here represented may be seen, that of two nuclei lying quite close to each other in the same fibre. It cannot, of course, be expected that a section should be cut which would run precisely parallel to the centre of a fibre for a great distance, though this would be necessary to demonstrate ocularly any great length of a canal in such a fibre. At the same time some of my sections do show fibres which seem to be channelled out for a considerable portion of their length. Of course, it might be said that all these spaces which have been depicted and described are simply the result of splitting of the tissue in course of preservation and preparation, and such an assertion would be difficult to disprove so far as the appearances in the longitudinal sections are concerned. The appearances, however, in the transverse sections do not seem to admit of such a view being reasonably entertained. The presence of the endothelial nuclei, and the fact that occasionally the whole circle of endothelium can be made out, most emphatically contradict such an assertion.

It would be interesting to know at how early a period of life the capillaries exist within the muscular fibres, for the manner in which the muscle tissue grows from nuclei, which at an early period are not to be distinguished morphologically from the nuclei from which the other tissues arise, proves that capillaries do not exist within the muscular fibres in young embryos. The explanation of the presence of the brown pigment which is always found in the muscular fibres of adult hearts is one requiring investigation. The fact that the cavities or channels which have been described are most common and most marked in the parts of the fibres near to the nuclei, and that the pigment too is found in the same position, would seem to point to this pigment as being in intimate relation with or derived from the blood.

Before leaving the subject, it would seem well to call attention to the fact that if further investigation by others should confirm the correctness of the views that have been unfolded, it may be found that we will be able to improve our understanding of the pathological processes that take place in the heart; processes which constitute an immensely important element in a great portion of chronic diseases, especially those of people past middle life. The fact that return vessels of considerable size, whether we choose to call them veins or large capillaries, have walls of exactly the same thickness and structure as the smallest capillaries is another evidence of the thorough provision there is for a bountiful supply of nutrient material to the heart. Vessels of this character, it would seem, must have a double, if not treble, function—the walls are so thin that they must partake directly in the nourishment of the tissue; they probably act as reservoirs, owing to their great distensibility; and, lastly, they certainly are carriers.

It would be easy for me to enter at length, and the temptation to do so is strong, into a discussion of the bearing of the observations that have been detailed upon questions of the pathology of the heart, but I must content myself by saying that in conditions of disease the cavities in the fibres are sometimes enlarged to such an extent that such fibres, when seen in cross-section present themselves as hollow cylinders with thin walls.

A brief recapitulation of the points it has been especially desired to emphasize may form the best conclusion of my remarks upon this anatomical question—a question which, viewed by itself, is of great interest, but when considered in its relation to pathology seems to me to open a field for labor and increased knowledge which may be of almost boundless extent. The points, then, are as follows:

1. That the return vessels in the substance of the heart, except a few of the largest size, have thin walls and a structure identical with that of the most minute capillaries. In this respect they present a strong contrast with the arterioles, as the latter, even when of very small size, are similar in structure with large arteries, both having three coats.

2. At points where these return vessels are formed by the coming together of minute capillaries, the number going to form the return vessel is very much greater than at corresponding positions where arterioles

(supply vessels) break up, and the angles formed are much less acute, right angles even being formed at such junctions of the venous vessels.

3. The observation of the presence of spaces in the fibres of normal human heart-muscle is likely to prove of great importance, if the explanation that they are capillaries is correct. The fact that endothelial nuclei can be seen at the edges of such spaces in almost all properly-prepared sections, and that occasionally even the whole circle of the endothelial wall is visible, would seem almost conclusive evidence of the correctness of this explanation.

SIX CASES OF FRACTURE OF THE UPPER EXTREMITY OF THE HUMERUS.

By Herbert Bramwell, M.D., M.R.C.S.

Fractures of the upper extremity of the humerus are of rare occurrence in comparison to similar injuries about the hip-joint. From among 338 fractures of the upper limbs which have come under my notice, six, or 1.7 per cent., were fractures through the upper extremity of the humerus, above the epiphyseal line. The six cases were all unimpacted fractures, and in two only were there any signs of comminution.

The cause of the fracture in each case was a fall directly on to the shoulder. The clinical features were as follows:

Case I.—T. W., a mason, aged twenty-four, while walking across the foundations of a house, fell forward, alighting with the whole weight of his body on the front of the right shoulder. From the description of the fall it was evident that the force applied to the shoulder was in a direction inward, backward and slightly upward. After removing his clothes both acromion processes were seen to be markedly prominent, resembling luxation of the acromio-clavicular joint. This condition was bilateral, and evidently a congenital formation.

The right shoulder was markedly broadened and swollen, presenting a depression of the deltoid muscle under the acromion process, but not to such an extent as occurs in a dislocation. There was also a swelling due to effused blood down the inner side of the arm. In front, half an inch below the coracoid process, and slightly to its outer side, was a prominent swelling, caused by the upper end of the shaft of the humerus, and moving with that bone.

The arm was rotated slightly inward, the elbow being carried away from the side, and he supported it with his left hand. He was quite unable to raise the arm, but could move it freely in an antero-posterior direction. This movement was attended by marked crepitus, audible to the bystanders, but gave rise to little pain. The extent of movement was greater than is usual in dislocation, and the elbow could be brought freely against the side. The arm was shortened to the extent of half an inch.

On palpation the fingers could be pressed under the acromion process on to an irregular surface, quite different from the smooth concavity felt when the arm is dislocated. On raising and abducting the arm, the upper end of the shaft with the lesser tuberosity, which caused the swelling under the coracoid process already referred to, became clearly defined under the deltoid, and moved when the arm was rotated. With the fingers of one hand passed under the acromion, and those of the other well up into the axilla, the head of the bone could be moved in the joint. After reducing the deformity it returned again, immediately the support to the arm was removed.

From these signs it was evident that the fracture extended through the upper extremity of the humerus, above the epiphyseal line; and from the loose feeling and crepitus under the deltoid it was probable that the greater tuberosity had been comminuted.

During the treatment great difficulty was experienced in preventing displacement of the upper end of the humerus forward and inward to the front of the axilla. After a trial of various means this displacement was most efficiently prevented by a plaster-of-Paris bandage, with a large pad in the axilla. The bandage, first applied round the upper part of the arm, was then carried round the back, so as to draw the upper end of the humerus backward; it was then continued in the form of a spica over the shoulder, preventing all movement of the joint, the elbow being kept well forward and the arm across the front of the chest. A sling was applied to support the forearm, and the whole bound firmly to the side.

Osseous union resulted, with a freely movable joint, though the action of the deltoid remained somewhat impaired. The upper end of the humerus projected slightly on the front of the joint, leaving a shallow depression under the acromion process.

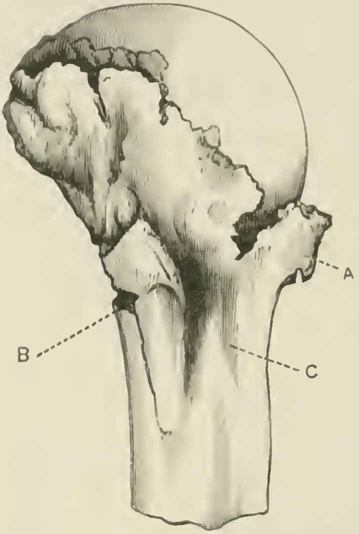
Case II.—A. J., aged sixty years, a widow, was knocked down by a tram, the wheel passing over the left leg at the knee-joint. On admission to the infirmary she was so collapsed that amputation of the mangled limb was impossible. Beside other injuries it was noticed that the right shoulder-joint was much swollen, and crepitus was felt under the deltoid.

She died some hours after admission, never having rallied from the shock. At the post-mortem examination the deltoid and pectoral muscles were found bruised and infiltrated with blood. The capsule of the shoulder-joint was lacerated at its anterior part, and the joint filled with blood. The head of the humerus was sunken into the greater tuberosity and the upper part of the shaft, being loosely held in position by portions of the capsule and periosteum. (Fig. 1.)

The greater tuberosity was broken into several fragments, the two largest portions corresponding to the external surface and anterior margin; this latter portion being continuous with the external margin of the bicipital groove, which was partly separated, see B (Fig. 1). The lesser tuberosity, A, formed a projection below the head of the bone. C indicates the position of the bicipital groove.

In spite of the extensive comminution, the head of the bone was still connected to the tuberosities by several portions of periosteum, and the fragments were held together by portions of periosteum and the reflection of the capsule. By these means the impaction was maintained, and if the patient had lived the nutrition of the various parts would have been carried on.

FIG. 1.



Head and upper part of the shaft of the humerus, removed post-mortem in Case II.—A. J., widow, aged sixty years, suffering from impacted fracture of the neck of the humerus, and compound comminuted fracture of the knee-joint.

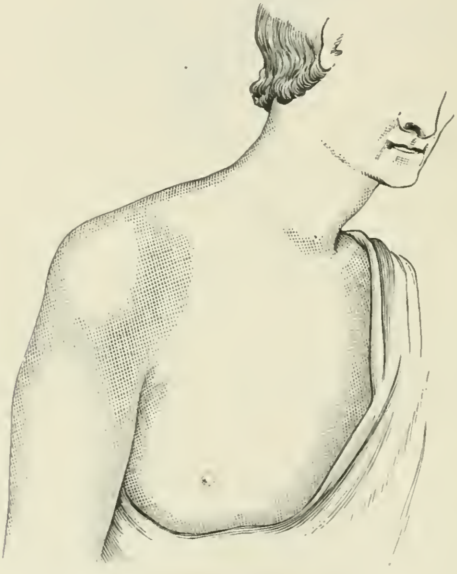
A. Lesser tuberosity. B. Outer margin of the bicipital groove and greater tuberosity. C. Bicipital groove.

CASE III.—J. C., a laborer, aged sixty-one years, was admitted to the Newcastle-on-Tyne Infirmary on October 19, 1886, with a history of having some hours previously fallen directly on the right shoulder. After removing the patient's clothes, a pointed prominence under the coracoid process with flattening of the deltoid muscle were at once noticed. (See Fig. 2.)

The patient was completely unable to move the arm, supporting it with the other hand. The direction of the axis of the limb resembled that of a dislocation. There was half an inch of lengthening, due to the extension caused by the weight of the arm. On pressing the fingers under the acromion process a hollow, which resembled the glenoid fossa with an elevated margin, could be felt. By raising and abducting the arm crepitus was produced and the deformity remedied, to return again immediately the support was removed. With the arm thus supported the sharp irregular margin of the greater tuberosity projected prominently against the deltoid, and to its inner side, but separated from it by a notch; the lesser tuberosity formed a distinct prominence. Both tuberosities moved with the shaft of the bone.

The hollow under the acromion process and the displacement of the upper end of the shaft into the axilla were so marked as to be suggestive of a dislocation; but the ease with which the deformity was remedied and the distinct crepitus proved the existence of a fracture. The patient was anæsthetized to afford a more complete examination of the joint, and when muscular relaxation was obtained the already mentioned appearances of the tuberosities were rendered still more obvious. The head of the bone was now distinctly felt in the glenoid cavity, thus proving the case to be one of fracture through the anatomical neck, the line of fracture probably implicating the upper part of the great tuberosity. The treatment of the case was difficult, owing to the tendency of the humerus to become displaced forward and inward. This displacement was at one time so great that the pressure of the lesser tuberosity caused redness and œdema of the skin in front of the joint. It was eventually almost completely overcome by the application of a plaster-of-Paris bandage, applied in the manner described in Case I. Firm osseous union resulted, the upper end of the humerus being ankylosed to the head slightly in front of the normal position. This gave rise to the appearance of an old unreduced dislocation, in which a new socket had been formed for the head of the bone. There was free movement of the arm in the antero-posterior direction, but the movements of abduction and elevation were much restricted.

Fig. 2.



A drawing of the right shoulder, in Case III.—J. C., a laborer, aged sixty-one years. Admitted to the Newcastle-on-Tyne Infirmary October 19, 1886. The sketch was taken immediately after admission.

Cases IV. and V.—These two cases presented symptoms of a very similar nature. Both patients were females over sixty years of age, who had fallen directly on to their shoulders. The most noticeable features of the cases were the following: Drooping of the affected shoulder, due to the injured muscles being unable to support the weight of the limb. Slight lengthening of the arms, amounting to half an inch in both cases, and caused by the extending force of the weight of the limbs having gradually overcome the shortening usually found in such cases. A considerable time had elapsed between the accidents, and the examination of the patients being four days in one case and thirty-six hours in the other. In each case a depression was present under the acromion process, easily obliterated by abducting and elevating the arm, which movement gave rise to crepitus. When the arm was rotated the tuberosities were felt to move with the shaft of the bone, which proved the line of fracture to be above the surgical neck. Both cases recovered with osseous union and movable joints.

Case VI.—A. W., aged twenty-eight years, a mason, fell from a scaffold, alighting on the right shoulder. When brought he was faint and collapsed, and presented an extensive swelling of effused blood surrounding the shoulder, obliterating the landmarks, and filling the axilla.

The normal axis of the arm was not altered, but the patient had to support it with the other hand. When the arm was rotated, distinct crepitus was produced under the deltoid muscle. At this time the seat of the fracture could not be ascertained with certainty, owing to the great swelling. After some days of perfect rest and the application of belladonna fomentations, the swelling and pain had greatly diminished, and a more accurate examination was made. It was then found that the shaft of the humerus was entire and the tuberosities moved with it, their irregular upper margin being felt under the deltoid. On pressing the fingers up into the axilla the neck of the scapula and lower margin of the glenoid fossa were found to be uninjured, and the head of the humerus was felt in the glenoid cavity. Rotation of the arm when pushed up and abducted produced distinct crepitus. From the above symptoms the injury was considered to be a fracture of the anatomical neck, with probable comminution of the greater tuberosity.

After prolonged treatment firm union was obtained with slight forward displacement of the upper end of the humerus. The joint remained for a considerable time very stiff, but eventually free movements, with the exception of abduction and elevation, were procured.

Remarks.—The unusual occurrence of fracture through the anatomical neck of the humerus, and the difficulties associated with its diagnosis, warrant the publication of such cases.

It is a fracture occurring generally in advanced life; in young persons falls on the shoulder are usually followed by such injuries as fracture of the clavicle, separation at the epiphyses, or simple dislocation.

When fractures of the upper extremity of the humerus are compared with those of the same region of the femur, a marked resemblance is at once apparent. They may be divided into two classes, viz.:

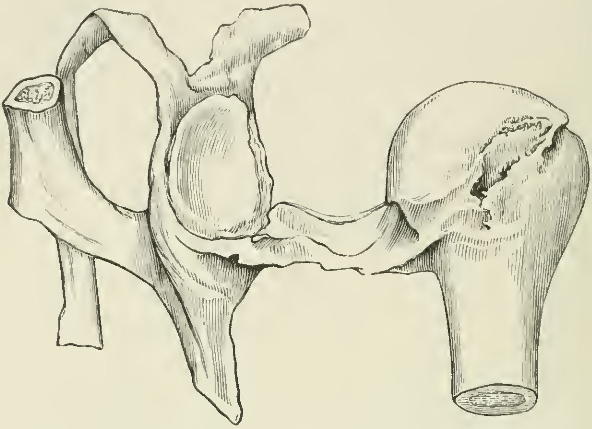
1. Intra-capsular fractures; being those which implicate the anatomical neck of the humerus alone, and produced by the sharp margin of the glenoid cavity cutting through the neck of the bone.

2. Extra-capsular; produced by the head and neck being driven into the tuberosities, resulting in comminuted fractures either impacted or unimpacted.

The mechanism of the first variety has only recently been clearly made out, and the possibility of fracture of the anatomical neck with a dislocation of the joint occurring at the same time is now proved beyond doubt.

The simple intra-capsular fracture of the neck of the humerus is caused by direct violence to the shoulder-joint, producing first a partial dislocation of the head on to the anterior margin of the glenoid cavity, when, from a constrained position of the elbow preventing its separation from the side, as in ordinary dislocation, the sharp margin of the glenoid cavity cuts through the anatomical neck. If the capsule of the joint remains unruptured, no dislocation will occur; but if it should be torn, the end of the shaft, and even the head of the bone, may be displaced into the axilla.

Fig. 3.



A drawing from a specimen in the Edinburgh University Museum, of a recent subcoracoid dislocation of the shoulder-joint, with a partial fracture of the anatomical neck of the humerus. Intra-capsular fractures of the neck of the humerus being caused in this manner, we are unable to understand how the unique case related by Smith in his work *On Fractures* was produced. In this case the head of the bone was found to have been completely separated, and rotated so that its cartilaginous surface was next to the fractured end of the humerus, the capsule of the joint remaining unruptured.

In the *Medical Times and Gazette* for March, 1866, Mr. Jonathan Hutchinson states that "It is possible that fracture and dislocation may occur simultaneously. Two or three times I have suspected this, though I have never had the opportunity of proving it or of examining a dissected specimen. It is, *à priori*, very improbable that such lesions should be produced together; when the neck of the bone snaps by violence, there is no longer any agency by which the head of the bone, now discontinuous with the shaft, should be displaced; and, on the other hand, if once the bone is dislocated, it would be exceedingly difficult by any continued violence to break it. I suspect, therefore, that most cases in which we hear of dislocation and fracture together are really cases of fracture unusually high up, and in which the appearances of dislocation are subsequently simulated."

Since that date several recorded cases of fracture through the anatomical neck of the humerus, and sometimes combined with dislocations, have proved the possibility of the injury. Records by Professor Bennet, of Dublin, of five cases are given in the *British Medical Journal* for 1880, page 349, and in the *Edinburgh Medical Journal* for March, 1887. Dr. F. M. Caird has fully explained the mechanism of this injury.

In Case III., recorded above, there is no doubt the fracture was limited to the anatomical neck of the humerus. The hollow under the acromion and the displacement of the upper extremity of the shaft into the axilla were so marked as strongly to resemble a subcoracoid dislocation; but the ease with which the deformity was reduced and the presence of distinct crepitus proved the existence of a fracture.

Cases IV. and V. are also examples of intra-capsular fracture.

The second variety of fracture of the upper extremity of the humerus is identical with the extra-capsular fracture of the hip. It may be impacted or unimpacted and the tuberosities comminuted. It is caused in the same manner, namely, by the head and neck of the bone being driven into the tuberosities from direct violence to the shoulder. It may be associated with a longitudinal fracture of the shaft of the bone, the greater tuberosity being separated from the rest and carrying with it a longitudinal splinter of the shaft. This is present to some extent in the case represented in Fig. 1. In the *Edinburgh Medical Journal*, May, 1863, Mr. J. Bell records a case in which dislocation forward was complicated by longitudinal fracture, separating the greater tuberosity from the head and lesser tuberosity, assigning the injury to the edge of the glenoid being forced against the posterior groove of the humerus.

Cases II. and VI. are typical examples of the extra-capsular fracture of the upper extremity of the humerus.

In the treatment of the above-recorded cases splints were found to be of little use. Shoulder splints of poro-plastic and gutta-percha welded over the joint did not prevent the forward and inward displacement of the humerus. Broad flannel bandages or plaster-of-Paris bandages applied in the method already described were the most efficient means of maintaining the normal position of the bones. The results of treatment were in all cases satisfactory. Osseous union was obtained in each case, though the upper end of the humerus was invariably displaced slightly forward and inward. This, however, did not impair to any great extent the movements of the joint, only those of abduction and elevation remaining at all restricted.

REVIEWS.

Principles of Surgery. By N. Senn, M.D., Ph.D., of Milwaukee, Wis., Professor of Principles of Surgery and Surgical Pathology in the Rush Medical College, etc. Illustrated with 109 wood engravings. 8vo., pp. 601. Philadelphia and London: F. A. Davis, 1890.

Truly recognizing that while the many treatises on surgery which have been published of late years in English "are replete with valuable practical information," yet that "most of them are defective in those parts relating to the matter treating of the fundamental principles of the art and science of surgery," the author has set himself the task of giving to the English-speaking student and practitioner a text-book such as his perhaps more fortunate German *confrères* have long had available. This task has been accomplished, and so much more than accomplished, that in the present volume we have the most masterly work on modern surgical principles that exists in any language.

To its composition the author has brought not only the personal knowledge and experience of a master of his art and science, but has leavened every page with the most modern facts and theories culled from a perusal, apparently, of all pertinent literature, which he has selected, classified, and arranged in his own terse, useful, and in every way satisfactory manner. The result is a work of which anyone might well be proud; and in the near future not to be familiar with its contents will argue one to be behind the times.

To those who have read Dr. Senn's *Surgical Bacteriology* the style and much of the substance of the present volume will appear familiar. In fact, that remarkable little book serves as text and foundation for the more comprehensive work in hand.

Those portions of surgical science usually classed as "principles," with one important exception and several less important additions, are in it elaborately treated from the modern bacteriological standpoint. The exception mentioned refers to the omission of "tumors" from the volume for some trade reason. This is much to be regretted, as the completeness and comprehensiveness of the work is thereby marred, and although the preface states the intention of the author to shortly publish the missing chapters as a monograph, we cannot but feel disappointed that so important a division should be absent from an otherwise complete and most masterly composition. In the next edition, which will certainly be soon called for, we hope to find the book complete.

To criticise even in a general way the ideas advanced, arguments used, or conclusions drawn in this volume, would carry us much beyond available space and be of little value, as the author has been most fair to all yet true to the best judgment of those most competent in these fields to-day; while minor details do not call for comment in such an epoch-marking work as this. Throughout, it has been the author's successful endeavor to keep in view "the difference between the cellular processes as we observe them in regeneration and inflammation, and to connect the modern science of bacteriology more intimately with the etiology and pathology of surgical affections" than has hitherto been attempted by authors. While the work is essentially not a Practice of Surgery but a Surgical Pathology, still considerable space is given to clinical features under each heading, in which diagnosis and treatment are presented in a practical yet thoroughly scientific manner in accord with modern views.

Chapter I. deals with regeneration of tissues in general, and Chapter II. with regeneration of special tissues—the distinction between regeneration or non-inflammatory healing being sharply contrasted with inflammatory or septic union, and the cellular processes of regeneration and its aseptic attainment being clearly and minutely set forth. Chapters III. and IV. treat of inflammation in general and in special tissues in a manner not elsewhere to be found. Chapter V. sums up all present knowledge of pathogenic bacteria, and is taken almost bodily from *Surgical Bacteriology*, giving the essentials of that book in even better shape than in the original. The four succeeding divisions discuss suppuration from the etiological and clinical standpoint as well as the varieties of suppuration in various organs, tissues, and cavities; peritonitis, brain abscess, cerebral localization, craniotomy, and abdominal section all coming in for eminently modern and practical demonstration.

Two chapters are devoted to necrosis and one each to pyæmia, septicæmia, erysipelas, and tetanus, the latter disease being described as due to a ptomaine arising from a recognized and definite bacillus—the bacteria remaining almost exclusively in the tissues about the point of infection and in the lymphatics leading therefrom to the cord. The remaining divisions cover surgical tuberculosis, hydrophobia, actinomycosis, anthrax and glanders. The sections upon tuberculosis are amongst the best and most interesting in the whole book, especially in view of the recent great prominence into which the subject has been brought. To those desiring to know everything available in this direction we confidently recommend these chapters as the very best which have been written. In relation to hydrophobia, Pasteur's views are unqualifiedly endorsed, and a very practical addition to the article is a concise description of the symptoms and disease-history of hydrophobia in the dog.

The illustrations are almost without exception of microscopical subjects and borrowed from foreign sources, but well chosen and good in execution and effect. A very meagre index, and, in many places, poor page-headings make the work unnecessarily difficult for reference.

T. S. K. M.

PROSTITUTION UND ABOLITIONISMUS. Briefe von Dr. B. TARNOWSKY, Professor an der Medizinischen Akademie zu St. Petersburg. Pp. 222. Hamburg und Leipzig: Verlag von Leopold Voss, 1890.

PROSTITUTION AND ITS ABOLITION.

THE well-known author of this latest and interesting contribution to the literature of an almost threadbare theme should surely know of what he writes. He has long been a director of one of the venereal clinics in

St. Petersburg, and his work as one of the staff of editors and contributors connected with the *Internationalen Centralblätter für die Physiologie und Pathologie der Harn- und Sexualorgane,* is sufficiently known. The present work consists of a series of letters, with an introduction by Professor Zuelzer, of the same journal.

The letters touch comprehensively and with fairness almost every one of the points now contested between the so-called "abolitionists" (those who aim at the high level of the extinction of prostitution), and those content with the lower plane of our author and many others (who look upon attempts at abolition as more than impracticable, even working harm in leaving to its unmolested career the evolution of one of the greatest of social evils), who advocate the toleration of prostitution by law, and its supervision and regulation by the aid of a medical police. In the view of these last, the prostitute infected with disease is to be treated like any other morbific germ, prevented from multiplication of its special toxic effects till it is rendered harmless by proper treatment; the woman infected to be by force, if need be, subjected to removal to hospital and medicinal management till no longer capable of spreading infection.

Accordingly, we find here freely discussed: the errors committed by those who from time to time have attempted investigation of the subject; the reasons why physicians enjoy exceptional opportunities for the study of the social problems arising in connection with it; the origin and principles of the "abolitionists," with some account of their unsuccessful attempts to secure their ends in Moscow in the year 1887; the possibility or the reverse of uprooting the entire practice from modern centres of of population (the author believing that the history of prostitution from the time of Moses to the present, and the intensity of the sexual instinct at all times in the young of the male sex, will always render such efforts abortive); and information on the well-known theme of the practices of prostitution from the earliest antiquity. He discusses questions relating to the influence of public houses upon the morality of the people at large, and the supposed influence of such resorts in spreading corruption throughout the community. He devotes some space to a consideration of the public and private rights of the prostitute, not neglecting consideration of the " consumers of prostitution," giving tabulated statistics of the ages and occupations of male patients infected with venereal disease in the brothels of the city where he resides. He naturally devotes space to the unfortunate women of the class represented in the public houses—not merely to those born in the atmosphere of such a life, but to those also who have been enticed into or dragged into their surroundings. He studies them from the point of view of heredity, of their social surroundings, and of their sympathies with their own and with the opposite sex. He gives the results of anthropological and anthropometric examination of women of this class, and he naturally finds that as a rule there is a decided tendency to deterioration of race type in all. Naturally, he bestows attention also to the relation of prostitution to the spread of syphilis, and believes that whatever good may be accomplished in the direction of limitation of the latter may be profitably exerted in the restriction and regulation by law of the former.

It is not many years since these questions, each and all, would have had significance and interest for the American practitioner. But to-day it is certainly within bounds to remark that their consideration has given place to the task of solving weightier problems, on whose issue is to be determined the position of these minor questions. These latter are certainly not the greater, let him think it who will. Says a recent writer in the *Westminster Review:* "As a means of lessening the amount of the diseases associated with the practice of prostitution, the system of legal recognition, toleration, and regulation always has proved, and always must prove, a complete failure." The average legislator in America is not wholly destitute of common sense, and the strong suspicion that in this connection "protection does not protect," must greatly influence his judgment. Scarcely can one find in cities of a larger population the number of applicants for relief of venereal diseases that crowd the public clinics of Paris. It would be difficult to find outside of a Paris hospital one hundred beds in a line filled each with a man suffering from some disease of the testicle.

The argument that syphilis is a malady largely spread by the practices of prostitution, and that by the legal regulation of the latter the extension of the former may be enormously limited, is really a syllogism with a fallacy—the fault lying not merely in what the logicians of the text books call the "undistributed middle." There is also a *suggestio falsi*, which there is here not space to demonstrate, by which it is implied that syphilis is not only one of the gravest of all the pests that afflict the human family, but that it multiplies itself till it surpasses the ordinary estimates of the statistician, being in point of fact not merely transmissible in generations, but the fruitful source of a long list of kindred ills. Our author himself falls into this error of the street by enumerating (p. 216) scrofula, rickets, and "einer ganzen Reihe schwerer Erkrankungen" as greatly induced by the infection of lues!

Never were positions more erroneously taken. When the expert has eliminated all the emotional views of this subject, all the fears of the victims of the disease, all the horror of those who look upon it from afar, all the traditions of the practitioner who sees it but very rarely, and all the extravagant eructations of the advertiser, there is a singular shrinking of fancy to cold fact.

The truth is that syphilis, though greatly deforming the body in its serious moods, rarely destroys life; its fatal issues are fewer by far than those of pneumonia, scarlet fever, erysipelas, and dysentery. It destroys the life of the few, spares the many, and, in a very large proportion of cases, is in the end an annoying, but not a grave, affection. It often does destroy life in its victims of the second generation, but these are in a minority, and in the third it is a pathological curiosity. It is always declared by its own symptoms, never by those of any other disease. and the popular doctrines as to its etiological relations with "scrofula" and other diseases are delusions of the imagination. Indeed, it is more than probable that, as our knowledge of the ptomaines produced after bacterial invasion of the system are better understood, we shall be in position to explain the unquestioned exemption of the immense number of those once affected with syphilis from the encroachments of tuberculosis, mycosis fungoides, and other of the infectious granulomata.

These are not popular doctrines; one is almost tempted to say that for that reason they are probably well founded. Prostitution is more harmful in other ways than by reason of its dissemination of syphilis. If the eradication of the latter could by any possibility work the abolition of the former, it were wiser to begin to inject a properly prepared "lymph" with a view to the complete syphilization of the human family than to attempt to accomplish the same end by taking prostitution under the wing of the Legislature. There are thousands of men in the world who owe the redemption of their foul lives to an early, well-treated syphilis; it would be difficult to say as much for the other side. The glimpse we now have of the possibilities of science in the future make the promise of managing syphilis so satisfactory that we may pluck it out of the arguments in favor of legalizing prostitution. If to-day it be the chief argument, the cause of the legalizing party is hopeless, and the "abolitionists" have the field to themselves.

We commend Dr. Tarnowsky's work as a complete treatise on the subject he discusses, and a compendium of most of the facts which can be obtained as a basis for the discussion of his theme.

J. N. H.

BAKTERIOLOGISCHE DIAGNOSTIK: HILFSTABELLEN ZUM GEBRAUCHE BEIM PRAKTISCHEN ARBEITEN. Von JACOB EISENBERG, M.D., PH.D. Dritte völlig umgearbeite und sehr vermehrte Auflage. Nebst einem Anhange: Bakteriologische Technik. 8vo., pp. xxxi., 510. Hamburg und Leipsic: Verlag von Leopold Voss, 1891.

BACTERIOLOGICAL DIAGNOSIS FOR PRACTICAL WORKERS.

EVERY bacteriologist will welcome with enthusiasm this third and much enlarged edition of a very valuable aid to practical work. The increase in size corresponds very well with the increasing influence and results of the work upon bacteria, and it is especially pleasant to see that a large number of organisms are described, beside those actually and formally approved by the Berlin school. Three hundred and seventy-six bacteria are tabulated and described, with references to the original papers, and a new method of grouping is adopted which is as satisfactory from a medical point of view as anything yet attainable. There are first, of course, the two great divisions of the non-pathogenic and the pathogenic microörganisms. The non-pathogenic class is subdivided into the micrococci, the bacilli, and the spirilla; and these again into the gelatin-liquefying and non-liquefying groups; whilst the ultimate grouping depends upon whether they do or do not produce pigment in the course of their growth.

The pathogenic organisms are classified: 1. As pathogenic to man. 2. As pathogenic to animals. 3. As pathogenic to animals and found in human beings. 4. As pathogenic to animals but coming from various outside sources.

Finally comes the series of fungi—as yet too small in number to be differentiated as are the preceding.

The author has introduced another interesting and valuable table, in which the bacteria are arranged according to their most common source—thus there are given ten pathogenic organisms that are commonly found in water, and so on. An exceedingly convenient addition to the book is the summary of bacteriological technique that concludes the volume. Here may be found in very brief form the formulæ for all the most important nutrient materials, staining reagents, and methods of preparation for the microscope that have been introduced of late years, and that are nowhere else collected so well.

Taken as a whole, the book is the most useful companion to work in the bacteriological laboratory of which we have any knowledge.

H. C. E.

THE STRUCTURE OF THE CENTRAL NERVOUS SYSTEM. By DR. LUDWIG EDINGER, Frankfort-on-the-Main. Second revised edition, with 133 illustrations. Translated by WILLIS HALL VITTUM, M.D., St. Paul, Minn. Edited by C. EUGENE RIGGS, A.M., M.D., Professor of Mental and Nervous Diseases, University of Minnesota. Philadelphia and London: F. A. Davis, 1890.

WE have read this book with great care, and do not hesitate to give it unqualified praise. Its author handles a difficult subject so successfully that the book is not only instructive but interesting—which is a great deal to say of a merely anatomical work. The treatise has two merits of first importance—clearness and brevity. It moreover tells us mainly what the author has himself seen, and does not speculate about the unknown functions of invisible parts. It is copiously illustrated, many of the cuts being from the author's own sections. Thus, while they are sometimes rather crude in execution, and not always elegant in appearance, they impress the reader as being reliable.

We have, of course, not attempted to verify all the author's statements; this, in a book devoted to the minute anatomy of the nervous system, were attempting too much. It is possible that a hypercritic might hunt out and proclaim some errors or some debatable statements, but we do not feel called to such work. We simply record the impression made upon us that the book is clear in description, attractive in style, and trustworthy in statement, and must let Dr. Edinger's well-earned reputation stand for all this, as it is well able to do.

Some reflections suggested by this book may, however, be noted here. It becomes more and more clear as the minute anatomy of the central nervous organs is demonstrated by the improved methods of modern research, and the whole more fully harmonized with recognized functions, that our knowledge of this wondrous structure has been hindered not a little by the awkward terminology left us by the older anatomists. This is not a mere matter of words. To give a thing an inappropriate name—or, worse, a half-score of inappropriate names, all of them conveying no sense and hard to remember—is to make exact and useful knowledge of that thing not only difficult but next to impossible. A fantastic nomenclature is in fact a sign of dense, almost hopeless ignorance. The brain has suffered especially in this way. It was such a complete *terra incognita* to the former generations, who had no distinct ideas of its division of functions, that they overloaded the science with a stock of names which for lack of meaning and uncouthness of sound is not equalled in any department of human knowledge. It is too much, perhaps, to hope to see all this verbiage cast aside at once; but that it will ultimately be much simplified we fully believe. Too much of it still lingers. Why should the motor tracts be called "pyramids" and the sensory tract a "fillet" or a "lemniscus?" Why retain the "pulvinar" of the optic thalamus when by general consent the "nates" have been ignominiously pushed out? Dr. Edinger's book deals as little with obsolete terms as an anatomical work well can, and this fact accounts not a little for its clearness and usefulness.

If we were to specify any portion of the book as exceptionally well done, we would select the chapters on the mid-brain and its immediate connections. We commend also the clear demonstration of the development of the brain from the primary vesicles, well illustrated from comparative anatomy. This is the corner-stone of the science of cerebral anatomy; if it is well laid the superstructure of knowledge assumes, naturally, order and beauty.

The translation of the book seems to have been done carefully. The author is to be congratulated on being so well presented to the large circle of readers which we hope he will find in America. J. H. L.

A Treatise on Massage, Theoretical and Practical, with Results in over Fifteen Hundred Cases. By Douglass Graham, M.D. Second edition. New York: J. H. Vail & Co., 1890.

That this book has reached the second edition in six years shows that it has been a success in the instruction it was intended to give. In its 350 pages it covers the ground most thoroughly for the student who desires the history, etc., of the art, but it will not be of much service to the busy practitioner, as the latter will probably find it difficult to extract from it the directions necessary for his use.

The author objects to the use of pictures, illustrations, etc., preferring to rely alone upon what he says can be better described by words; yet, we cannot but feel, in the multiplicity of words, that the learner will be more confused than he would have been by even poor engravings.

The definition of massage as "a group of procedures which are best done with the hands, such as friction, kneading, manipulation, rolling, and percussion of the external tissues of the body in a variety of ways, either with a curative, palliative, or hygienic object in view," is expressive. This combination of movements, passive, resistive, and assistive, is often spoken of as the Swedish Movement Cure.

His history of the art is particularly full, yet we cannot see in a book of this character the necessity for history being carried to an account of the abode and characteristics of the Aryan nation.

He gives due credit to Metzger, Ling, and Mitchell for their prophylactic and scientific application of the principles.

The remark that rubbing should be tender and gentle, yet strong, is very good. The effect of massage is best expressed by the sentence on page 79, where he says "it arouses dormant capillaries, increases the area and speed of the circulation, furthers absorption, and stimulates the vasomotor nerves, all of which are aids and not hindrances to the heart's action and to nutrition in general, as more blood passes through the *masséd* region in a given time and nutrition is thereby increased." It is undoubtedly to this fact that massage owes its fame. The benefits of massage are not only from its effect upon the capillaries and bloodvessels, but particularly by its stimulation of the flow of the diseased and worn-out tissues through the lymph channels and lymph spaces.

He groups the proceedings chiefly under four heads, viz.: friction, percussion, pressure, and movement, and gives the dose of massage as dependent upon the frequency and force of the manipulation and the length of time during which these are to be employed when considered with regard to the effect upon the patient.

On page 70 he states that rest after severe exercise brought no essential recovery, while massage for the same period produced decidedly better results.

His theories of Rest Treatment, pages 94 and 95, are very correct, and the directions and methods for the performance of manipulation for neurasthenia, paralysis, muscular atrophy, neuralgia, muscular rheumatism, rheumatoid arthritis, ankylosis, and fractures, etc., are practical and of much advantage. In writer's cramp and allied affections and for the treatment of scoliosis, as well as for the treatment of sprains, the benefits to be derived from this treatment are clearly shown. He also speaks favorably of its effects upon the conditions in which it is less commonly applied, as, for instance, diseases of the eye, nose, and pharynx.

As already stated, the book will repay one who has the time for its perusal. DE F. W.

OINTMENTS AND OLEATES, ESPECIALLY IN DISEASES OF THE SKIN. By JOHN V. SHOEMAKER, A.M., M.D., Professor of Materia Medica, Pharmacology, Therapeutics, and Clinical Medicine in the Medico-Chirurgical College, Philadelphia, etc. Small 8vo. Second edition, revised and enlarged. Philadelphia: F. A. Davis, 1890.

IN this volume the author has concisely presented the formulæ and methods of preparation of the various ointments to be found in the Pharmacopœias and other authorized publications of the United States, Great Britain, Germany, Austria, France, Italy, Spain, Mexico, and Chili. Other ointments in common use, and yet not having official recognition, are also referred to. The therapeutical uses of the individual ointments are briefly stated. The introductory portion of this section, Part I., refers to the properties of the oils and fats commonly employed for anointing purposes. Lanolin is especially commended; it may be stated, however, that as regards the alleged superiority of this substance as an ointment-base, opinion is at the present time divided. The preponderant feeling is still, we believe, in favor of lard for ordinary ointments where a softening and penetrating influence is desired. Part II. is entirely devoted to a consideration of the origin, preparation, and application of the various oleates. While the author apparently still holds to his well-known statements and belief as to the favorable action of these ointments, the same views are not shared by others engaged in dermatological practice. In fact, with the exception of two or three of the oleates the consensus of expert opinion is against their usefulness; one reason for this, doubtless, is the difficulty of obtaining stable and well-made preparations.

As a book of reference for those whose practice is largely made up of cases of cutaneous disease, this publication—Part I. being especially referred to—will have its value. S.

THE LORD OF HUMANITY, OR THE TESTIMONY OF HUMAN CONSCIOUSNESS. By FREDERICK JAMES GANT, F.R.C.S., Senior Surgeon to the Royal Free Hospital. London: Hatchards, 1890.

IT is noteworthy that an eminent surgeon should turn aside from the more material aspects of his special profession to a study of the psychological problems of humanity. It reveals a versatile personality, uniting practical service with ethical progress.

Mr. Gant believes firmly in a personal God and is, further, an earnest Trinitarian; whatever the scholar who reads the work may think of the doctrinal portions, the beauty and vigor of the author's mental conceptions are most striking in the concluding chapters on the "Death of Man," "Moral Law in Disease," and "Consequent Death." Some passages remind one of the classic writers in their moral height, their practical force, and their refined simplicity. Throughout, the author argues for the earthly regeneration of man and for the evolution of a purified soul worthy of immortality; for the cultivation of love and righteousness—"In the highest type of *human* character, these two moral attributes are necessarily connected, and they always move together, for love can love only that which is lovely." (Page 76.)

The analytical power of the plea for the survival of the personal "I" after the death of the body is remarkable, especially if the reader recalls the pithy observation of George Eliot, who allows one of her characters to say of Lydgate, "It is seldom a medical man has true religious views—there is too much pride of intellect."

Of course the evidence employed by Mr. Gant is largely of the presumptive kind. Not even the most subtle thinker can positively assert that which God has thought wise to conceal from man's vision, physical or mental; but the intellectual energy of a pure, cultured and reverent nature vivifies every sentence, causing the reader to lay down the book with a deeper conviction of the usefulness of life on earth, and a brighter hope for the spiritual progression of the soul in a future state.

M. M. C.

TRANSACTIONS OF THE ASSOCIATION OF AMERICAN PHYSICIANS. FIFTH SESSION, HELD IN WASHINGTON, D. C., MAY, 1890. Vol. V. 8vo., pp. 275. Philadelphia, 1890.

TRANSACTIONS OF THE MEDICAL SOCIETY OF THE STATE OF PENNSYLVANIA. FORTIETH ANNUAL SESSION, HELD AT PITTSBURG, 1889, 1890. 8vo., pp. 333. Philadelphia, 1890.

TRANSACTIONS OF THE MICHIGAN STATE MEDICAL SOCIETY. TWENTY-FIFTH ANNUAL MEETING, HELD IN GRAND RAPIDS, JUNE, 1890. 8vo., pp. 477. Detroit, 1890.

THAT our American medical societies are improving very much in the character and permanent value of their work, a rapid survey of these volumes of *Transactions* seems to demonstrate. Particularly is the improvement to be noticed in that of the Pennsylvania Society. The address in medicine by J. C. Wilson, that in hygiene by T. J. Mays, that in surgery by John B. Roberts, that in obstetrics by Frances N. Baker, and that in mental disorders by Alice Bennett, are all above the average of such papers.

Dr. Wilson takes an advanced position upon the question of medical education. Dr. Mays has made a very strong argument against the theory of the contagiousness of consumption. Dr. Roberts very clearly sets forth the modern doctrines of surgery. Most of the other papers are of an extremely practical tendency.

Among the very many good papers in the *Transactions* of the Association of American Physicians, we have been especially attracted to those of Weir Mitchell (upon "Some Disorders of Sleep"); A. A. Smith (upon "The Etiology of Pleuritis, especially in its Relation to Tuberculosis"); and Reginald H. Fitz (upon "Acute Pancreatitis"); but there are many other papers equally worthy of separate mention.

We were very much pleased to note in the able paper of Dr. Walker, of Detroit, upon Brain Surgery, in the Michigan *Transactions*, that due credit was given to John B. Roberts, of Philadelphia, as a pioneer in America in this line of work. Dr. Roberts had the courage of his convictions when he was almost in a minority of one. With the dazzling feats of Horsley and others before us we are apt to forget this. Dr. Walker's cases are interesting and valuable. Another important paper in this volume is that of McGraw, upon "The Value of Fæcal Vomiting as an Evidence of Acute Intestinal Obstruction."

Henry B. Baker has an interesting paper upon "Vaccination *versus* Compulsory Vaccination," opposing the latter only because he thinks that it would not be as efficacious as where a certain degree of liberty is allowed.

V. C. Vaughan contributes a very important paper upon "The Fundamental Factors in the Causation of Infectious Diseases," summing up his conclusions as follows: "The germ is only one of the factors in the causation of infectious diseases; other factors are to be found in disordered digestion and impoverished blood."

Many of the other papers are interesting and instructive.

S. S. C.

DE L'IDÉE DE PERSÉCUTION DANS LA MÉLANCOLIE ET LE DÉLIRE DES PERSECUTIONS. Par BLIN (EMMERY-EDOUARD-EUGÈNE), Docteur en Médecine de la Faculté de Paris, etc. Paris, 1890.

ON THE DELUSION OF PERSECUTION IN MELANCHOLIA AND THE INSANITY OF PERSECUTION. By EMMERY-EDOUARD-EUGÈNE BLIN, M.D., etc. Paris, 1890.

IT is, perhaps, one of the most significant signs of great activity of medical thought, and especially in medical writing, that we begin to have not mere essays, but whole treatises on the most specialized subjects, and even upon their various aspects. We doubt if this is always a healthful sign. There is always in nature an end somewhere of differentiation; and we believe that there is, or ought to be, even in medicine, an end somewhere of specialization. The benefit derived from a too prolonged and exhaustive study of a mere symptom-group is evidently lessened in direct proportion to the time wasted in vain repetition and useless elaboration. It is more wholesome for the mind to contemplate a whole subject, even though it suffers somewhat in details, than a very small part of a subject, be this part polished never so much. Dr. Blin's book is an example of this extreme subdivision of a subject which we begin to see in medical literature. With the exception, however, of the criticism implied above, we have nothing to say of the book but what is good.

The monograph is a study of the idea, or delusion, of persecution, its pathogeny, characteristics, evolution, diagnosis and prognosis, as it is found in melancholia, in certain degenerated types (alcoholic, etc.), and in the insanity proper of persecutory ideas, or, as we call it here, monomania or delusional insanity. It does not pretend to be a complete study of these several forms of insanity, or of any one of them. It, however, builds up about this one central idea quite an exhaustive clinical study, based upon thirty-seven cases reported in detail.

Since Esquirol created the word monomania to include the several forms of "partial" insanity, or insanity of fixed systematized delusions, a constant effort has been made to improve upon or displace the term, to which scientific alienists seem with difficulty to adjust their ideas. Lasègue, in 1852, we are told by Dr. Blin, separated from melancholia, and treated as a distinct type, the *délire des persecutions*, which is evidently the same as our monomania with persecutory ideas—the criticism of the term being, as Dr. Blin's cases show, that the patients do not entertain ideas of persecution only, but alternate with them ideas of ambition and grandeur. Dr. Blin analyzes and compares the various ideas of persecution as found in this morbid type of Lasègue in melancholia and in degenerated mental states. The mode of reaction of the patient to his delusion in monomania (as we still prefer to call it) and in melancholia is well described by the author. The monomaniac accuses *others* of his misfortunes; the melancholic accuses and condemns *himself*. The monomaniac regards chiefly himself—he is an egotist; the melancholic has care for others, and thinks himself the cause of their unhappiness.

Dr. Blin's conclusions, briefly, are as follows: The delusion of persecution presents differential characters in its mode of origin, pathogeny, construction and evolution in these three forms of insanity.

In the degenerated alcoholic and hereditary type it begins suddenly, without prodromes, and is characterized by incessant change. A rapid cure, with probable relapses, may be expected.

In the true "insanity of persecution" a period of inquietude or incubation is observed; the idea when formed is systematized, exact, with numerous details. There is an appearance of verisimilitude. The patient is egotistical; he accuses others and opposes them, while his facial expression is active and decided. The idea of persecution gives place to delusions of ambition; in some cases these alternate; the details of these delusions are precise. The case ends in dementia.

In the melancholic the *début* of the idea of persecution may be sudden and accompanied with excessive agitation. Sometimes it shows itself little by little, and may be grafted upon a previous melancholic delirium. The idea has some system, but not many details. There is altruism, the patient accusing himself; the face is sad and dejected. Cure is probable, with possible relapses and chronicity. J. H. L.

PROGRESS

OF

MEDICAL SCIENCE.

THERAPEUTICS.

UNDER THE CHARGE OF

FRANCIS H. WILLIAMS, M.D.,
ASSISTANT PROFESSOR OF THERAPEUTICS IN HARVARD UNIVERSITY.

Peroxide of Hydrogen as a Remedy.

Dr. W. B. Richardson calls attention to this valuable remedy, in which he has interested himself for many years, in fact—since 1858. The peroxide of hydrogen is still made, as Thénard first made it, by the action of an aqueous acid solution on peroxide of barium. Water may be made to contain ten or twenty or even thirty volumes of the peroxide; the usual strength is what is known as a fifteen-volume solution. In order to keep the oxygen in the solution, it is necessary to have it slightly acidified, either by dilute nitric, hydrochloric, or phosphoric acid. In this form the solution can be administered internally in doses varying from a fluidrachm to a fluidounce; but two to four drachms diluted in ten fluidounces of water may be considered an average dose. The taste is peculiar, being identical with that of ozone when inhaled by the mouth, and not at all dissimilar to the taste of chlorine in a weak solution. When it is to be injected the solution should be rendered neutral by the cautious addition to it of caustic soda or potash. The soda is to be preferred; but it should not be neutralized until the time it is wanted. In the ten-volume solution it may be injected either into the cavities or into the cellular tissue without being further diluted. The solution of the peroxide is incompatible with many substances, but it is compatible with the following: the mineral acids, tannin, alcohol, glycerin, alcoholic solutions of the alkaloids, and alcohol combined either with ether, amyl hydrate, amyl nitrite, or iso-butyl.

The oxygen from the peroxide can also be administered by inhalation by means of a simple apparatus. Into a glass vessel having two necks, like the ordinary Wolff's bottle, a few ounces of the peroxide solution are placed; a tube from a funnel, the tube having a stopcock, runs through the stopper of the bottle to the bottom of the contained solution. From the second neck of the bottle there springs another tube for inhalation, at the free end of which is a double-valved mouthpiece, like the oldest and best of the chloroform inhalers. The apparatus is now ready for use. When it is wanted the funnel is charged with a solution of permanganate of potassium in the proportion of ten grains of the permanganate to a fluidounce of water. The tap is then turned, the permanganate solution flows into the peroxide solution, and immediately oxygen derived from both bodies is briskly evolved. This, if necessary, can be caught in a flexible balloon or bag, from which it can be inhaled in measured doses, but this is not requisite. Should the practitioner desire to combine the oxygen with ether, or with any other volatile body soluble in ether but not in water, he can allow the ether or ethereal solution to float on the top of the peroxide solution. Then, as the oxygen escapes, the ether, or the ether with its other volatile comrade, passes over in combination with its oxygen. A patient can help himself to a dose at any time, as may be directed, by merely adding a measured quantity of the permanganate solution. Nitrite of amyl can be inhaled in this manner with ether, and, in short, there is here a means of administering most of the active volatile medicaments by inhalation, and in a form most ready for combination with the blood as it passes in its course over the pulmonic circuit. For a styptic and deodorant spray for the throat the following form is useful: alcohol (sp. gr. 0.830) half an ounce, tannin twenty grains. Dissolve the tannin in the alcohol with an ounce of distilled water and then add the ten-volume peroxide of hydrogen solution to six fluidounces.

The peroxide solution can be used as a gargle, antiseptic, and astringent. A good form for the purpose is: tannin ten grains, glycerin one ounce, distilled water four ounces, diluted hydrochloric acid ten minims, solution of peroxide of hydrogen sufficient for eight fluidounces—to make an eight-ounce gargle. Another simple yet useful preparation of the peroxide is as an unguent, for inunction over the surface of the skin after scarlet fever and other affections where there is free shedding of dead cuticle. The ointment is made by rubbing up ozonic ether with spermaceti ointment so as to form a thin paste, which may, if desired, be rendered thick by the addition of a little more spermaceti, or thin by the addition of olive oil.

Applied to the throat in diphtheritic patients, the solution of peroxide, either alone or in combination with glycerin, causes, without any doubt, a rapid separation of the false membrane, and produces a favorable condition of the local surface. But here the benefit ends; on the general or constitutional conditions it has not as yet been efficient. The twenty-volume solution can be applied freely to the fauces, with borax or with glycerin, and to adults it can be administered in the form of spray. In a case of chronic dysentery with frequent motions of a fluid and offensive character, Dr. Richardson prescribed the ten-volume solution with tannin, in one-ounce doses, diluted with a pint of tepid water. The injection was thrown into the bowel once daily, through a long O'Beirne tube, and as the oxygen was liberated freely in the intestine soon after the injection was thrown in, the evidence was supplied of the excretion of purulent fluid, or of some excreted matter from the blood. The result was very satisfactory and led to a rapid and sound recovery.

Peroxide of hydrogen may be used as an inunction for the surface of the body of patients affected with cutaneous exfoliation, as in scarlet fever and measles. In these instances the ozonic ether is used instead of the aqueous solution, because of the facility with which it mixes with the oil or lard required to make an ointment. The body is rubbed from head to foot with the ointment, the spaces between the fingers, toes, and flexures of the joints being included. The application is very agreeable to the patient, and the effect in removing obnoxious odor is most marked. But the grand advantage lies in the circumstance that the process seems to remove all danger of infection from the convalescent after three or four applications.

In diagnosis peroxide of hydrogen may be of great service. It diagnoses pus from mucus. In cases where it is necessary to distinguish between purulent expectoration and that which is not so, the sputa are placed in a test-tube containing a solution of peroxide. If the matter produces liberation of oxygen, the evidence of pus is strong; and if the same event occurs after all carbonic acid is removed, the presence of either pus or of some plastic element of blood or cellular-tissue element may be affirmed of a certainty.

Injected into a closed mucous cavity like the bladder, the surface being in a healthy state, and the viscus having been emptied of urine and washed out with warm distilled water, there is no liberation of oxygen from a neutral solution of peroxide. But if there be any ulceration, by which a surface of cellular tissue is laid bare, or if there be pus present, then the escape of oxygen will be so free from two or three ounces of a ten-volume solution injected into the bladder, that the gas may be detected as it escapes from the free end of the catheter by its effect in re-lighting a partly extinguished taper. In physiological research no danger was found in injecting a neutral solution of peroxide into the cellular tissue. This practice might possibly be adopted on the human subject.

In asphyxia, as after drowning and after suspended animation from chloroform and other narcotics, a hundred pints of oxygen might easily be transfused, hypodermically, by using the thirty-volume solution; and, with the temperature of the solution raised to blood-heat, the diffusion of the gas through the cellular tissue would oxidize the blood rapidly, and tend to give new force to the circulation.

In regard to peroxide of hydrogen, it is well to recall the important fact that the remedy we have had before us has about it the peculiarity that it is a purely natural remedy, that it is not toxic, and that with the exception of the danger of producing by it gaseous accumulation in the blood, under some conditions of its use—a danger which admits of being avoided—it is free of all risk. In its remedial application, too, there is no complexity as to its action. In every instance that which it effects is oxidation: for asphyxia it is oxidation, for breaking up pus and exudations it is oxidation, for destroying infectious and fœtid organic secretions or excretions it is oxidation. —*Lancet*, No. 14, 1891.

PEROXIDE OF HYDROGEN IN ABDOMINAL SURGERY.

DR. CHARLES P. NOBLE is enthusiastic about the remarkable qualities of peroxide of hydrogen. Its importance as a pus-destroying agent is becoming more and more recognized. In general, in order that antiseptic or germicidal agents may be used effectively, it is absolutely essential that all foreign material, discharges, etc., be first removed, so that the agent may be brought in direct contact with the surface or tissue to be acted upon. It is also true that the power of penetration of the antiseptics in common use is slight, so that they are reliable only in combating strictly superficial septic processes. This is particularly true of corrosive sublimate solution, which, by its action on albuminous discharges, forms an impenetrable covering which prevents the solution from coming in contact with the tissues to be acted upon. In this respect the action of the peroxide solution is essentially different. It attacks, disintegrates, and oxidizes all discharges and dead tissue with which it comes in contact, thus favoring its contact with and action upon underlying tissues. Moreover, the products of its activity escape as water and carbonic acid gas.

In cleansing the hands preparatory to an operation it is very useful. In cleansing the abdominal wound preparatory to removing the sutures, the peroxide solution has proved efficient. If any pus has formed in the track of the drainage-tube or of any of the sutures, the peroxide solution will remove it more efficiently than any other agent.—*The Medical News*, No. 15, 1891.

THE COMPOSITION AND ACTION OF PEPTONIZED MILK.

IN the physiological laboratory at Cambridge, P. Horton-Smith, B. A., has made some tests with peptonized milk in regard to the amount of peptones they contain, and their action when used in considerable amounts.

The milk used was peptonized for a longer period than is usual in practice, namely, an hour and a half; at the end of this time the liquid was boiled for three minutes.

It seems from the examination of milk prepared in this manner, that there is not, after all, a very large amount of true peptones, but the change has gone only so far as to form albumoses, which constitute the chief part of the proteids in such milk. In all the preparations of peptonized food which were examined, the same fact has been brought out; in none of them is the proteid chiefly in the form of peptone, though all contain this in greater or less quantity, but in all the albumoses are the chief proteids present. Hence the popular belief that peptonized foods relieve the digestive organs of all work can no longer be entertained. Their task has been considerably lightened, but the final step in digestion, the conversion of albumoses into peptone, has still to be effected in great part by themselves.

The investigator further decided to try the effect upon himself as regards the amount of urea, uric acid, and total nitrogen when living upon a diet of peptonized milk compared with living upon a normal diet.

Having made himself familiar with the methods which he intended to employ, he proceeded to diet himself. He decided to live three days on peptonized milk and three days on milk, and it was thought these would be amply sufficient for purposes of comparison. For three days he lived on peptonized milk, and then, after a break of five days, feeling perfectly well, for three days on milk. In neither case was any other food or drink taken, except five thin arrowroot biscuits each day, weighing in all just one ounce. These biscuits contain practically no nitrogen, and were merely taken so as not to cut off solid food entirely. At first, perhaps, they were necessary, as the purely liquid food was trying. To make the conditions exactly similar during both diets, the same short walk was taken each day, and one cigarette only smoked.

When living on milk diet five pints of milk a day were taken, in four portions—a pint at breakfast, a pint at lunch, a pint in the afternoon, and two pints in the evening. On this diet he lived very comfortably and felt perfectly well throughout, except that in the early morning and evening he felt exceedingly tired—due, doubtless, to the fact that all stimulants, even tea, were now cut off. There was never the slightest suspicion of diarrhœa, and the stools were normal in amount and whitish in appearance—due, doubtless, to the large amount of fat ingested. On this diet, during the three days three pounds in weight were lost.

When dieting on the peptonized milk more than five pints had to be taken, both because five pints of the milk did not seem quite enough, judging from the loss in weight on the milk diet, and also because a certain amount of the proteid in milk has in the peptonized milk passed into leucin and tyrosin, and, therefore, become useless for nutrition. Accordingly, seven and a half pints were now taken. There was never on this diet the slightest suspicion of diarrhœa; the stools were also white as before, and apparently normal in amount. During the three days one and a half pounds were lost.

As regards the urea eliminated, of which tables are given, the experiments seem to show that the ingestion of albumoses and peptones, even in very large quantities, does not derange in the least the nitrogenous metabolism of the body. As regards the excretion of urea, it was found that this body bears almost exactly the same relation to the total nitrogen on the peptonized as on the normal diet. The uric acid excreted was found to remain normal in amount, and the ordinary relation of urea to total nitrogen to be unchanged. —*Journal of Physiology*, vol. xii., No. 1.

GARGLE IN CASES OF FŒTID BREATH.

Bicarbonate of sodium
Saccharin . . . . āā ʒj.
Salicylic acid
Alcohol . . . . ℥iv.

A teaspoonful in a cup of water; use as a gargle several times a day.—*Nouveaux Remèdes*, No. 6, 1891.

SALOL IN THE TREATMENT OF DIARRHŒA OF MALARIAL ORIGIN.

MONCORVO has held the belief for several years, that the intestinal tube was the seat of abnormal fermentation in cases in which the organism is the subject of general infection. Bacteriological investigation of the intestina contents of individuals with infectious diseases have been made, and a great number of microörganisms have been found, some of which were evidently living there and multiplying in the normal course of events, while others were associated with general intoxication.

Such diseases as typhoid fever, cholera, etc., in which the germ is in the intestinal mucous membrane are excluded. Especial attention has been given by the author to those cases in which enteritis has been superadded to certain infectious diseases in children, such as malaria, variola, rubeola, varicella, and yellow fever. The climate of Brazil, in which country the author resides, is such that malarial intoxication exceeds in gravity and frequency all the other infectious diseases from which children suffer.

Naphthalin was first tried in the class of cases under consideration with considerable satisfaction, but naphthol was subsequently found more efficient. Salicylate of bismuth was also very efficient in cases in which the flux was considerable. Salol was next tried in forty cases of malarial diarrhœa, and the results of its use are embodied in the following conclusions: Salol may be considered a valuable agent for intestinal antisepsis in children of any age who are affected with enteritis or entero-colitis of malarial origin. The intestinal flux diminishes and then disappears under the influence of salol, its deodorizing effect upon the stools becoming manifest almost immediately after its use is begun.

The gases resulting from intestinal fermentation are not produced as long as salol exercises its antiseptic action. The colic and vomiting also cease in a very short time. The drug is well tolerated by children of all ages, and in none of the author's cases did it produce the least sign of intoxication. The doses employed varied from three grains to thirty grains, according to the age and gravity of the case.—*Archives of Pædiatrics*, March, 1891.

SUBCUTANEOUS INJECTIONS OF SALT SOLUTION IN ACUTE ANÆMIA AND CHOLERA INFANTUM.

A SIX-TENTHS per cent. solution of salt was first used in four cases of cholera infantum, two dying and two recovering. To the solution was added a little alcohol. The solution was sterilized and kept at a temperature of 103° to 104°. The apparatus used was a glass funnel with a rubber tube one and a half yards long, to which a cock was attached, the end of which fitted into the canula, connected with a small trocar. In place of the foregoing, one may use for children a small syringe, holding about two-thirds of an ounce, to which a long aspirating needle may be attached. The transfusion was made into the skin of the abdominal wall; the absorption was assisted by massage over the point of injection. For infants, one to two ounces is a sufficient quantity for injection, and it could be repeated if collapse rendered it necessary. No unpleasant phenomena are likely to accompany the injections. After the operation the head should be lowered, the feet raised, elastic bandages should be wrapped around the child, and other excitants should be used as occasion calls for them. The same treatment may be used in collapse following extensive hæmorrhage, either in children or adults.—*Archives of Pædiatrics*, No. 87, 1891.

DANGERS OF SULPHONAL.

ALTHOUGH sulphonal is probably one of the safest, as it is one of the most efficacious among the hypnotics recently introduced, the series of cases published by Bresslauer, of Vienna, show clearly that it has certain dangers.

The degree of peril is difficult to estimate, as the patients were lunatics, and were also apparently feeble; but the fact is significant that out of seventy-seven patients who were treated with the drug, no less than seven showed serious symptoms, and in five of these there was a fatal termination. It ought to be mentioned that the patients had been taking the drug for a considerable time in good doses, and had borne it well until symptoms of disturbance set in, these being great constipation, dark-brown urine, slow or in some cases rapid but feeble pulse, discolored patches resembling purpura on the limbs, and great prostration. In the cases which ended fatally the cause of death was heart failure, with œdema of the lungs.—*Lancet*, April 4, 1891.

APOMORPHINE FOR CONVULSIONS.

DR. HORSLEY, of West Point, Georgia, has used apomorphine to arrest convulsions in strychnine poisoning, and under various conditions. Others have reported the use of this drug subcutaneously during the aura to prevent epileptic attacks, and to stop infantile convulsions. Dr. Horsley thinks that the remedy has hitherto been used principally for its emetic action. He accidentally found that it controlled the spasms produced by strychnine poisoning, since which time he has used apomorphine for all convulsions, and has in no case been disappointed in the result.

From his limited experience he is confident that apomorphine would probably control any spasm not caused by lesion of the brain or spinal cord.

He has not used it in tetanus or in rabies, nor in puerperal eclampsia, though its use arrested symptoms which led him to expect an attack of eclampsia.

The dose ranged from one-twentieth to one-eighth of a grain, and has been uniformly administered by subcutaneous injection.—*Medical Record*, No. 23, 1891.

PEROXIDE OF HYDROGEN AS A DISINFECTANT OF WATER.

DR. ALTEHOEFER finds that the addition of one part of the peroxide of hydrogen to one thousand of ordinary drinking-water, to drinking-water containing typhoid bacillus or cholera bacillus, is quite sufficient to destroy the various saprophytic and pathogenic organisms contained under these conditions, if it is obtained perfectly fresh and kept in good condition, and if it is allowed to act for a period of twenty-four hours. It is specially valuable for the disinfection of drinking-water, because it does not affect the taste, does not alter the color, and in the proportion mentioned is perfectly innocuous. As regards cost, he calculates that sufficient drinking-water, say two gallons and a half, for a family may be sterilized by means of peroxide of hydrogen at a cost of about five cents per diem.—*British Medical Journal*, 1890.

IS ETHER TO BE PREFERRED TO CHLOROFORM?

DR. JULLIARD, Professor of Surgery at Geneva, answers this question at length and in detail; he compares and contrasts the two anæsthetics from various standpoints, and prefers ether. Of course, ether is far safer than chloroform, and the inconveniences which attend the administration of ether have been exaggerated.

It produces just as complete anæsthesia as chloroform, and the dangers of ether, its inflammability and its irritating action upon the respiratory passages, may be avoided by careful administration.

After using chloroform for fifteen years, and after an experience with ether extending over fourteen years, he affirms that it is no more difficult to etherize a patient than to chloroform one.—*Revue Médicale de la Suisse Romande*, No. 2, 1891.

PYRIDIN IN GONORRHŒA.

℞.—Pyridini	. . . .	grs. v.
Aq. .	. . . .	℥iij.—M.

S.—One injection daily.

It is said that three or four injections are sufficient to give relief.—*Therapeutische Monatshefte*, No. 1, 1891.

ACTION OF JAMBUL UPON THE QUANTITY OF SUGAR IN THE URINE OF DIABETICS.

DR. ROSENBLATT reports a case of diabetes in which the symptoms were notably ameliorated by the administration of syzigium jambolinum. It may be given in the form of powder, three-fourths of a drachm to four drachms, in twenty-four hours, or in fluid extract, three-fourths of a drachm to five drachms a day.

In a patient, aged twenty-eight years, who passed from six to eleven quarts of urine a day, containing from 8 to 8½ per cent. of sugar, or about thirty ounces of sugar in twenty-four hours, syzigium jambolinum reduced the urine to about five quarts, and the quantity of sugar to about twenty ounces a day. The man's condition was improved, and the amelioration was in proportion to the amount of the remedy employed.—*Nouveaux Remèdes*, No. 3, 1890.

TREATMENT OF DYSENTERY BY ENEMATA CONTAINING CORROSIVE SUBLIMATE.

In the Military Hospital at Oran fifty-three cases of acute dysentery were given local treatment with corrosive sublimate. Two or three warm injections daily of about seven ounces of a 1 : 5000 bichloride solution were made; these were retained not more than ten minutes. Even after the first day's treatment the stools were fewer in number, and after three or four days the mucous character of the discharges disappeared. Tenesmus and pain were soon diminished. Where the anal opening had become irritated it was painted with a solution of cocaine before the injections were given. In cases where the pain was severe laudanum was also used. The bowels became so constipated in many cases that purgatives were required.

There were no toxic symptoms suggesting mercurial poisoning, not even a single case of stomatitis; the salt was probably little, if at all, absorbed. The excellent results of this treatment are attributed to a direct and fatal action of the remedy upon the microörganisms of dysentery.

In cases of chronic dysentery, with acute exacerbations, a single daily use of the remedy is sufficient.—*Centralblatt f. klinische Medicin*, No. 11, 1891.

MEDICINE.

UNDER THE CHARGE OF

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PSEUDO-HYPERTROPHIC PARALYSIS.

At a meeting of the Glasgow Pathological and Clinical Society (*Glasgow Medical Journal*, 1891) NESS reported three cases of pseudo-hypertrophic paralysis in brothers, aged eighteen, twelve, and eight respectively, while a fourth brother, aged sixteen, was healthy. The family history is interesting. Four maternal uncles and three male cousins of the patients' mother died with pseudo-hypertrophic paralysis. Thus, nine males in the same family were affected, the transmission, however, being clearly through the female.

CARDIAC EPILEPSY AND ESSENTIAL TACHYCARDIA.

TALAMON (*La Médecine Moderne*, 1891) has described the case of a man, sixty-three years old, who, after a fall of ten feet, striking the head, and remaining unconscious for a month and a half, became subect to crises of palpitation of the heart. The attacks occurred three or four times a month. They were sudden in onset, the patient, without premonition, feeling a sensation of a blow or shock in the precordial region. Almost at the same time there was subjective vertigo. The patient was often compelled to support himself to prevent falling. Palpitation now set in, with a sense of oppression and great anxiety. The face was pale, the eyes protruded, the patient answered in monosyllables. Dyspnœa was marked. The action of the heart was rapid and violent. The patient was conscious of the impulse against the chest. The sounds of the heart could not be analyzed. There was a continuous rumbling, without intermission. The pulse was small, feeling like a continuous vibration. At the end of a half-hour the attack ceased as abruptly as it set in, with a splitting sensation in the head. In the interval the patient was quiet. The eyes were normal. The thyroid gland was not enlarged. There was no cardiac lesion. Talamon believed the case to be one of essential tachycardia, though at first it had been designated as one of cardiac epilepsy, corresponding to the variety for which Trousseau proposed the name partial epilepsy, and which might, by analogy with that observed in hysteria, be called local epilepsy. In the same category, Trousseau included epileptiform neuralgia of the face, certain cases of angina pectoris, and painful convulsions limited to one side of the body. What characterizes these forms of masked epilepsy, as in ordinary petit mal, are the sudden onset, the rapid course and the abrupt termination. In the case related, the principal phenomenon of the onset of true epilepsy, the loss of consciousness, was wanting, but this is equally true of the epileptiform *tic* of the face, of migraine and of angina pectoris, which Trousseau regards as partial epilepsies.

It is necessary to distinguish essential tachycardia from symptomatic tachycardia complicated by valvular or organic lesions of the heart. The latter may be explained by reflex irritation of the diseased organ. In essential tachycardia, however, it is necessary to recognize a multiple etiology and that different causes can provoke the excitation of the nervous centres which determines the production of the manifestations. In considering epilepsy as one of these causes, a pathogenic hypothesis is proposed analogous to that of the bulbar origin of the tachycardia of Debove and Huchard. Talamon asks if it would not be desirable to determine: 1. If the attacks of essential tachycardia are not in some epileptics an equivalent of the convulsive phenomena to the same degree as are certain forms of delirium or other manifestations of petit mal. (It is said that the convulsions of epilepsy may be preceded by a cardiac aura, with violent derangement of the heart's action, which closely corresponds with the paroxysm of essential tachycardia.) 2. If in tachycardiacs an hereditary taint cannot be discovered, as exophthalmic tachycardiacs are found in neuropathic families.

THE QUANTITATIVE DETERMINATION OF HYDROCHLORIC ACID IN THE GASTRIC JUICE.

BOAS (*Centralblatt für klinische Medicin*, 1891), while admitting the value and accuracy of the methods of Mörner and Sjöquist, and of the modification of v. Jaksch, finds the procedures too complicated and time-consuming for the purposes of the general practitioner. To overcome these difficulties Bourget has recommended the following procedure: Barium carbonate is added to the gastric filtrate, which is then evaporated to dryness, the product reduced to ash, heated to whiteness and extracted with water. The chloride of barium is converted by a concentrated solution of soda (1 : 3) into carbonate, the precipitate collected and washed with water until the filtrate is no longer of alkaline reaction. Filter and precipitate are introduced into a beaker having a capacity of 100 c.cm. and overlaid by 10 c.cm. of a 1 per cent. solution of hydrochloric acid, the mixture shaken and water added to 100 c.cm. The solution is filtered. 10 c.cm., to which is added some phenolphthalein as an indicator, are placed in a cup and titration performed with a soda solution, of which 10 c.cm. represent 1 c.cm. of the acid solution. The figure thus obtained is deducted from the amount of acid added. The result represents the amount of hydrochloric acid in the gastric juice. To determine the accuracy of the method, Boas made comparative analyses of the gastric fluids in ten cases, using the modifications of v. Jaksch and Bourget, and found the differences slight. To further simplify the process, Boas proceeds in the following manner: To the solution of chloride of barium are added a few drops of a saturated solution of soda. The fluid is boiled, the precipitate collected upon a small filter and washed until the filtrate ceases to be alkaline. The filter is rinsed into a beaker, the carbonate of barium distributed by shaking, and enough of a one-tenth normal solution of hydrochloric or sulphuric acid added to dissolve all the barium chloride and give an acid reaction. The fluid is boiled to drive off the carbonic acid, some phenolphthalein added and titration performed with the one-tenth soda solution. The number of cubic centimetres of the soda solution required deducted from the amount of the solution of hydrochloric or sulphuric acid used represents the amount of hydrochloric acid in the fluid examined. The procedure thus carried out is, according to Boas, chemically unobjectionable, simple and convenient. In a note, he adds that the simplest method would be titration of the chloride of barium by means of a solution of carbonate of sodium, but the reaction is slow and its termination difficult of detection.

In determining the amount of free hydrochloric acid, Boas uses congo paper or congo solution as an indicator. Five or six drops of a saturated solution of congo red are added to the fluid to be tested, producing a steel-blue color. The fluid is diluted with water, and titration carefully performed with a one-tenth solution of soda, till the blue tint gives way to a brick-red coloration. The number of cubic centimetres of the soda solution used represents the amount of hydrochloric acid. If lactic or fatty acids are present in significant quantity, they should first be eliminated by means of ether.

Potassium Iodide in Phthisis.

Sticker (*Centralblatt für klinische Medicin*, 1891) proposes potassium iodide as a diagnostic agent and as a therapeutic adjuvant to the Koch remedy in the treatment of tuberculosis. More than two years ago he recorded the observation that where there exists a lesion at the apex of a lung, recognized by an impairment of resonance, an alteration in pitch or a harshness of respiratory murmur, but with the absence of râles and blowing murmur, the latter may be artificially produced by the administration, for a few days, of small doses of potassium iodide. It seemed as if the drug stimulated secretion, especially in the neighborhood of diseased tissue, thus giving rise to râles. The original observation has since then been many times confirmed and successfully applied for diagnostic purposes. The extended experience of Sticker leads him to believe that potassium iodide occasions changes in tuberculous structures analogous to those caused by the injection of the Koch fluid, differing only in degree. If moderate doses of the iodide be administered to a healthy individual, no changes can be detected in the lungs; administered, however, in a case of diffuse dry bronchitis, in the course of a few days an extensive moist catarrh, with fine and coarse moist râles, results. When there is limited involvement of the apices, recognizable only by slight alterations in quality and intensity of resonance and by modifications of the breath-sounds, the administration, for a few days, of moderate doses of potassium iodide is followed by the signs of a local catarrh. Similar manifestations appear in the area of circumscribed pleural adhesions or pleuritic roughenings. Not rarely the evidences of local reaction are gradually obscured by the signs of diffuse catarrh. In four cases of suspected tuberculosis, in which repeated physical examination of the lungs proved negative, the administration of the iodide for diagnostic purposes produced distinct signs of localized reaction in one or both apices, with tuberculous sputa. There was no opportunity for observations in cases in which neoplasms, parasites or gummata existed in the lungs. The influence of the iodide is thought to be curative, especially in chronic diseases of the lung associated with an increase of the interstitial connective tissue, with fibrous contraction and adhesive pleuritis, while creasote is more useful in cases in which caseation plays a prominent *rôle*. In a third group of cases, in which the bronchial mucous membrane is extensively involved, the balsams, with or without creasote, are the best remedies. Sticker believes the intervals between injections of the Koch fluid, when these are followed by reaction, ought not to be shorter than a week. To keep up a gentle influence in the interim, potassium iodide might be used with advantage.

The Products of the Tubercle Bacillus.

Crookshank and Herroun (*British Medical Journal*, 1891) presented to the Physiological Society of London a preliminary report on the chemical properties and physiological effects of the products of the tubercle bacillus in pure cultivations. The viscous residue obtained by evaporation from the filtrate of cultures of the tubercle bacillus, passed through porcelain and dissolved in distilled water, caused when injected into the healthy guinea-pig, fall of temperature, irregularity of cardiac action, muscular spasm, loss of control over the extremities, and death. From filtrates of pure cultures and by extraction from tuberculous growths of *perlsucht* it was possible to isolate an albumose and a ptomaine. In a preliminary series of experiments upon guinea-pigs it was found that injections of the ptomaine and of the albumose were followed in tuberculous animals by rise of temperature, with enlargement and induration of the affected glands, and in healthy animals by a slight indication of depression of temperature or hypothermic effect.

The Insanity of Epilepsy.

Wildermuth (*Centralblatt für klinische Medicin*, 1891) recognizes a chronic psychic degeneration and a transitory insanity of epileptics. The former has long been known and is characterized by progressive mental impairment. The second appears in two principal varieties: (1) psychoses, with derangement of consciousness; (2) psychic alteration, without such derangement. Under the first of these comes the deep epileptic sopor, occurring in connection with severe paroxysms, in all degrees from the profoundest stupor to partial consciousness. To the suspension or clouding of consciousness may be added vivid hallucinations, which may give rise to a sense of fear, with impulses of violence, or to ecstatic delirium. These conditions are often associated with a paroxysm, occur rarely as an equivalent of the convulsive seizure and only exceptionally precede an attack. Cases of the second group are more common than those of the first. These, again, may be subdivided into four varieties. In the first the degree of psychic alteration appears the same throughout the entire period of a series of paroxysms. In the second the mental condition is different before and after attacks: depression precedes, exaltation follows, or the reverse; in some cases reproduced with photographic accuracy. In the third, the psychic change is apparent only after the seizure; while in the fourth, the one replaces the other. When the epilepsy is of cortical origin the psychic changes occur late, the mental weakness rarely attains a high degree, and the ethical defect is inconspicuous. Decided preëpileptic or post-epileptic derangements are rare.

Clinically, infantile polio-encephalitis holds an intermediate position. The psychic disorders of multiple sclerosis range themselves in the same line. The important consideration from the standpoint of medical jurisprudence, is, that in addition to transitory insanity with loss of consciousness there occurs in association with epilepsy a group of mental disorders unassociated with loss of consciousness.

ATROPHIC SPINAL PARALYSIS AND MULTIPLE NEURITIS.

GOWERS (*Clinical Society of London*) read an account of a case of acute atrophic paralysis (acute anterior polio-myelitis), in which there was also a primary multiple neuritis. The patient was a boy aged seven years, in whom the paralysis developed after several days of constitutional disturbance. The first symptoms of this commenced within twenty-four hours of a quite cold bath, to which he was unaccustomed. The weather at the time was very hot. The atrophic paralysis involved the whole left arm and shoulder muscles and the right deltoid, triceps and biceps. At the end of a fortnight these muscles and all of those of the left arm presented the reaction of degeneration, and their paralysis and wasting proved permanent. Simultaneously with their palsy the legs became weak, although all movements could be performed. The knee-jerks were preserved throughout, and when the palsy had existed for a week they had become excessive, and a foot clonus had developed on each side. This continued for some months, although the legs gradually regained power; so that the child was able to walk in two months from the onset, and the legs ultimately became quite strong. The symptoms thus showed cervical anterior polio-myelitis extensive and severe on the left side, and on both sides involving slightly the adjacent white substance, so as even to cause some secondary descending degeneration in the pyramidal fibres, transient, and due to damage that passed away. The interest of the case, however, rested in the indications of neuritis. Even before the palsy was discovered the arms and legs became extremely tender, chiefly in the neighborhood of the elbow-joints and knee-joints, and thought to be in them because every movement and manipulation of the joints caused great pain. Careful examination showed, however, that it was entirely in the nerves—in the sciatic and popliteal nerves of the legs, and the ulnar and median, especially, in the arms. The tenderness lessened upward and downward, and was much slighter at the brachial plexus. The nerves of the left arm were more tender than those of the right. There was no anæsthesia or other evidence of damage to the conducting fibres of the nerves. These symptoms lessened in the course of a few weeks and passed away entirely, although the atrophic palsy persisted in almost its initial degree. They were certainly due to a multiple perineuritis, affecting the nerves in the middle of their course, primary, and developing simultaneously with the spinal lesion in consequence of the same cause.

In commenting on the case, Dr. Gowers remarked on the probability that the pain and tenderness met with in other cases of polio-myelitis, and usually referred to the joints, were really seated in the nerves, which suffer mechanical disturbance at every movement of the joints. Although polio-myelitis was probably produced through the agency of a blood state, the latter was certainly often generated by exposure to cold, and effective chiefly in the hot season of the year, which in some way predisposes either to the susceptibility of the individual or to the production of a toxic influence. Exposure to cold was capable also of causing the other and more common form of multiple neuritis, the parenchymatous variety, in which the nerve fibres suffered primarily, the sheaths scarcely or not at all, except in their nerves, and the incidence of the effect was peripheral and more perfectly symmetrical. A difference must exist in the blood state due to cold in the two classes of neuritis, and it was important to note the associations of the two forms thus produced. In this connection the author referred to the leading features of the two forms of neuritis, the parenchymatous and the adventitial, using the latter term as a designation for the variety in which the connective-tissue elements were primarily affected. Recent researches suggested that there were two varieties of polio-myelitis, the primary affection in one being of the nerve-cells, in the other of the basic substance of the gray matter; the former being analogous to the parenchymatous, the latter to the adventitial forms of neuritis. Reasons were given for regarding the polio-myelitis in the case described as of the second class.

The paper concluded with an allusion to the probability that an actual organized virus sometimes produced the adventitial form of neuritis by the direct influence of the organisms on the connective-tissue elements, and especially on the sheath—as was seen in leprosy, and might be the case in syphilis; while, on the other hand, the parenchymatous form was certainly often due to a product which the organisms produced by their growth in the body, as one active agent, alcohol, was produced out of the body. The question was suggested, as deserving study in this connection, whether diphtheritic neuritis commencing during the primary disease was not chiefly adventitial, and that which began when the disease was over, in greater degree parenchymatous; and the contrast was noted between the adventitial neuritis of the active stage of syphilis and the parenchymatous later form which often constituted part of the lesion of tabes.

Hydatid Cyst of the Pleura.

G. F. Duffey (*Dublin Journal of Medical Science*, No. 232) relates a case of a patient, aged thirty-one years, a subject of phthisis. He was admitted to hospital with urgent dyspnœa. Physical examination revealed what appeared to be a large right pleural effusion, with displacement of the heart. On the second day a trocar and canula were introduced in the seventh interspace near the scapular angle, and a clear, serous-looking fluid withdrawn. Alarming dyspnœa, with intense congestion of the head and neck, occurred during the operation. The canula was withdrawn after forty-seven ounces of fluid had flowed. He was relieved an hour later, but died the same night after another attack of dyspnœa which passed into coma.

Necropsy: The right lung was completely adherent; near its lower half a pouch was opened from which a quantity of clear fluid was ejected, followed immediately by the extrusion of a hydatid cyst the size of a fœtal head at full term. After this came a number of small, tense cysts of various sizes. The cyst was situated between the diaphragmatic and pulmonary pleura. The lung was pushed upward and compressed; the liver was depressed. The cyst-wall was laminated. No booklets nor echinococci were found.

Reference is made to the rarity of hydatid disease in Ireland, and to the great rarity of primary hydatid cysts of the pleura.

SURGERY.

UNDER THE CHARGE OF

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THE CLOSING OF TREPHINE OPENINGS BY CELLULOID PLATES.

A case was presented before the Vienna Medical Society by HINTERSLOISSER (*Wiener med. Presse,* No. 42, xxxi. Jahrg.), showing the successful result of an effort to close a trephine opening by a celluloid plate. The patient some months after recovery from a comminuted fracture of the left parietal bone, suffered from giddiness, weakness, lost of power in the right side of the body, and chronic twitchings of the right facial region and the corresponding upper extremity. Three years later epilepsy developed. Examination showed a hyperæsthetic depressed cicatrix corresponding to the position of the upper portion of the ascending parietal convolution. There was also bilateral concentric narrowing of the field of vision, diplopia on looking to the left, and sensory and motor paresis of the left side. The cicatrix was excised, a periosteal flap was raised, the depressed bone was removed and the healthy non-adherent dura was incised, showing normal brain cortex. The dura was sutured. On the fourth day it was found united. A polished celluloid plate was now fitted over the trephine opening, the periosteum was stitched over this, and finally the skin wound was sutured. Healing was prompt and all brain symptoms ceased.

According to Fillerbaum, celluloid was successfully used in a similar manner in two other cases of trephining.

OSTEO-DERMOPLASTIC AMPUTATION OF THE FOOT.

The purpose of this operation is to procure sufficient flap to cover leg ulcers so obdurate and extensive that amputation seems the only resort.

SCHINZINGER and BOGDANIK (*Wiener med. Presse*, No. 42, xxxi. Jahrg.) each report a case.

Bogdanik made a cut along the middle of the dorsal aspect of the foot, stripped off the skin and superficial fascia down to the nails, enucleated the foot at Chopart's joint, sawed off a part of the astragalus and os calcis, and stretched the redundant skin flap in such a position that the ulcer was covered almost completely. In this last case the result was not entirely satisfactory, as a portion of the flap sloughed and the subsequent cicatrization was exceedingly slow.

NITRATE OF SILVER IN THE SURGERY OF THE BLADDER AND URETHRA.

Nitrate of silver is commended by GUYON (*Le Mercredi Médical*, xi. an., No. 7) not only because in chronic inflammatory conditions of the bladder and urethra it develops a curative irritation, but because it is *par excellence* the best antiseptic which can be applied to the urinary tract. Clinical observation and laboratory research have alike proven that the silver salts attack and destroy the microörganisms which are found in altered urine. These salts are particularly efficacious in destroying or preventing the development of the pyogenic bacteria and the urobacillus liquefaciens, the pathogenic action of which has been most thoroughly studied out.

Employed as an antiseptic, nitrate of silver is prompt and often radical in its effects upon vesical suppuration. Some cases are merely benefited, others experience no relief. To the latter category belong long-standing inflammation of the bladder, so deeply seated that the drug is unable to reach the focus of trouble. Such cases may possibly be helped by a thorough curetting followed by the application of the drug. Solutions for injection into the bladder may be 1 : 500 to 1 : 300, or even 1 : 100; the strength last given should be employed only in exceptional circumstances. These solutions may be fairly considered the best hæmostatic application to vesical bleedings, particularly such as are dependent on subacute blennorrhagic inflammation. When the hæmorrhage depends upon a tubercular ulcer or a neoplasm the nitrate of silver injections do not yield satisfactory results.

In chronic urethritis nitrate of silver is constantly employed in Guyon's practice. The solutions vary in strength from 1 : 100 to 1 : 200.

Silver nitrate should also be employed to prevent infection from instrumentation in cases peculiarly prone to such infection—as, for example, in cases of long-standing vesical distention. The drug properly employed is able not merely to prevent such infection, but may arrest it after it has taken place.

GUNSHOT WOUND OF THE ABDOMEN.

Another case is added to the long list of gunshot wounds of the abdomen by MILES (*New Orleans Medical and Surgical Journal*, vol. xviii., No. 9.)

The wound was self-inflicted by a 32-calibre pistol, the missile entering in the median line of the abdomen at a point midway between the umbilicus and the pubes. The patient had eaten sparingly for several days preceding the infliction of the injury. Within half an hour he was placed upon the operating-table. His pulse was 108; shock was but slightly marked, and the abdominal pain was not severe. A median incision five inches in length was made. Much blood was found in the peritoneal cavity. The small intestine was carefully searched from the jejunum to the end of the ileum. The bullet wounded the mesentery in three places, perforated the small intestine sixteen times and lodged in the deep muscles of the back. The number of wounds was probably due to the fact that the intestines were practically empty. Aside from mucus and blood there was nothing escaped from the bowel wounds. The operation lasted a little more than two hours. Much time was consumed in securing bleeding mesenteric vessels. The intestinal openings were closed by means of Lembert silk sutures passed in the direction of the long axis of the bowel. The peritoneal cavity was douched with sterilized hot water and the abdominal wound closed.

The day following the operation the temperature rose to 102° F., the pulse to 150. After this the course of the case was favorable. On the fifth day intestinal gas escaped naturally. On the twentieth day there was voluntary fæcal evacuation. The patient was discharged cured in five weeks.

SOME OF THE DANGERS OF IMMEDIATE SUTURING IN CERTAIN CASES OF FRACTURE OF THE PATELLA.

FOWLER (*Brooklyn Medical Journal,* vol. v., No. 3) has, after an experience of thirteen cases of fracture of the patella treated by immediate suturing, somewhat modified his view that this treatment would become the most approved method of dealing with these injuries.

In a number of cases he observed persistent and widespread suppuration which occurred primarily outside the joint. He explains this by the fact that in certain cases the upper recess of the joint-cavity is ruptured. As a result there necessarily occurs an extravasation of the fluids effused on receipt of the injury and immediately afterward into the space between the vastus internus and the bone. The opening of the knee-joint in such cases is almost certain to produce suppuration, since it is impossible to reach this effusion by antiseptic lotions. Application of pressure would tend to further extension of the infection by forcing the effused fluids through the rent in the upper recess of the synovial sac, instead of permitting them to escape through the drainage-tubes placed in the joint.

This view was confirmed by the observations of Riedel, who, through a death on the table during an attempt to suture a fractured patella as a primary operation, was enabled to make an immediate examination of the are increased, this might be considered as a proof that the joint-cavity was still intact, and when this condition is present Fowler believes that the primary operation of suture may be resorted to without delay and with almost positive safety, except when in addition to the break in the patella there are extensive and severe contusions in the neighborhood of the joint. If a case is thus complicated the lessened vitality of the part renders its resistance to infection so slight as to constitute a very positive contra-indication to exposing the tissues to infection.

Even though the operation is not advisable immediately after the injury, the surgeon need not reject entirely the idea of operation. After one or two weeks, when the inflammatory exudate has been absorbed, and the injured tissues have regained their vitality, the knife may be used with safety.

Arterio-venous Aneurism of the Cavernous Sinus; Cure by Operation.

Mayo (*Northwestern Lancet*, vol. xi., No. 4) was consulted by a patient aged fifty-six years for the relief of a squint. One year before the patient suffered from a head injury, complaining later of headache and dizziness. From the time of injury the right eye was turned in, and three months before coming under observation the left eye also began to converge.

On examination, complete paralysis of the right external rectus with partial paralysis of the corresponding muscle of the opposite side was noticed. The veins in the sclerotic and conjunctiva were dilated and pulsating, as were the right angular vein and right superior palpebral vein ; the eyeball having a perceptible impulse synchronous with the heart-beat. The ophthalmoscope revealed nothing but a somewhat congested retina. A distinct bruit could be heard by placing the ear in contact with the patient's head. Deep pressure on the right common carotid stopped the bruit and the pulsation in the vein, also relieving the headache and vertigo.

The right common carotid artery was ligated. Immediately on applying the ligature the patient had several slight epileptiform spasms. The right side of the face became blanched and symptoms of profound shock were manifested. On the fifteenth day slight pulsation was felt above the seat of ligature; this was due to absorption of the catgut, and partial opening of the lumen of the vessel. The coarctation, however, was sufficient to greatly reduce the circulation and give relief, so that the patient was able to resume his ordinary work ; this he has continued without interruption for ten months.

THE PRESENT LIMITATIONS OF SPINAL SURGERY.

ABBE (*Canadian Practitioner*, vol. xvi., No. 5) contributes a valuable paper on the subject of spinal surgery.

He believes that the Morton injection for spina bifida should be no longer employed, but that the sac of this tumor should be excised by the method of Mayo Robson.

In spinal caries the operation should be undertaken when sinus drainage is exhausting the patient. Then the curetting may extend even to the bodies of the vertebræ. Tubercular sinuses should be cleansed with peroxide of hydrogen and iodoform injections. Cold abscesses should be treated at first by Brun's method.

In paraplegia from fracture, operation should not be undertaken until the hæmorrhage has been absorbed and the bones have united. A subjective sense of tingling and pain in the paralyzed and anæsthetized limbs is an indication rather of irritation of a divided cord by the cicatrix or by bone spicula than of conduction along the cord. Observation of absence of tendon reflexes is the only satisfactory proof of probable transverse lesion. Involuntary twitching and jumping is a reflex action having its nervous origin in the distal part of the divided cord. It may exist years after the injury and must not be regarded as probably indicating ultimate recovery. Operation offers little hope in total transverse section.

galvanometer over the surface after removal of the magnet, a deviation was evident. By repeated searching with the galvanometer the position of the foreign body was accurately determined and the direction of its long axis also became apparent. The surface was marked with nitrate of silver and the following day the operation was performed. Incision was carried down to the capsule of the joint without finding the needle. On placing a galvanometer needle in the wound, such an action was manifest that the operator felt no hesitation in opening the joint. A considerable quantity of sanguinolent synovia escaped and the needle was found in the upper angle of the incision lying between the synovia and the fibrous capsule and corresponding closely in position with that marked on the surface by the aid of the galvanometer.

Kocher had a patient in whom, after anomalous nervous symptoms, lasting many months, a needle was discovered by means of the galvanometer; and Dumont records a case in which a primary operation was unsuccessful in removing the foreign body, but a second operation, aided by the galvanometer, enabled the operator to reach the seat of trouble. In addition several cases are cited by Graeser, Lauenstein, and Kalin.

AN UNSUCCESSFUL CASE OF DIGITAL DILATATION OF THE PYLORUS FOR CICATRICIAL STENOSIS.

It is a rule of such universal acceptance in the profession that only successful cases should be reported that those who are sufficiently honest to record their failures are especially worthy of commendation. CUTLER (*Boston Medical and Surgical Journal*, vol. cxxiii., No. 25) reports a case in which death resulted from Loretto's operation.

The patient suffered from the typical symptoms of pyloric obstruction. No tumor could be felt anywhere in the abdomen. On inflation, the stomach was found to reach nearly to the pubes, and to give tympanitic resonance everywhere except in the right hypochondriac and right epigastric regions. The absence of tumor, pain and cachexia, together with the previous history of the case, suggested cicatricial stenosis from a healed gastric ulcer. Operation was decided upon. For two days the patient was fed by nutrient enemata. The day preceding the operation the skin of the abdomen was treated antiseptically. The day of the operation the stomach was thoroughly washed out.

An incision four inches in length was made between the ensiform cartilage and the umbilicus. The pyloric end of the stomach was exposed and was drawn four inches out through the abdominal incision. At this period of the operation the condition of the patient became alarming. Artificial respiration was resorted to, and in a short time the dangerous symptoms disappeared. On incision the pylorus was found so narrow that a finger could not be introduced into it. In twenty minutes sufficient dilatation had been accomplished to admit two fingers easily.

The opening in the wall of the stomach was closed, the mucous membrane being brought together with a continued silk suture. The whole operation lasted fifty-five minutes. The patient sank and died four days later, apparently from exhaustion.

GUNSHOT WOUND OF THE BRAIN.

LIMBECK (*Prag. med. Woch.*, xv. Jahrg., No. 45) reports the case of a woman who, one year before she was observed by him, shot herself, the bullet passing through the hard palate, and ranging upward and backward. She exhibited as a result of her injury complete paralysis of the oculo-motor nerve, homogeneous hemianopsia, right-sided hemiplegia, and marked disturbance of speech. As there was no wound of exit, it was impossible to determine the exact track of the ball, yet from the symptoms it would seem probable that the ball cut the oculo-motor nerve before its entrance into the orbit, destroyed Broca's centre, lacerated some fibres of the inner capsule, and wounded the posterior portion of the cerebrum, possibly involving the occipital lobe of the left side. This only, unless the left optic track were wounded, could account for motor aphasia and homogeneous hemianopsia.

THE PATHOGENESIS OF POPLITEAL CYSTS.

After post-mortem observations of over a thousand knee-joints, and after clinical observations of upward of a hundred patients suffering from cysts about the knee, POIRIER (*Le Progrès Médical*, t. xii., No. 43) states that popliteal cysts, even those which occupy the portion of the bursæ, are nearly always of articular origin. Of a hundred cases subjected to most rigid examination, not one was found which had not a distinct articular origin. The commonest and best-recognized popliteal cyst is that which is found external to the tendon of the semi-membranous in the popliteal flexure. It is very prominent when the leg is extended, but seems to disappear on flexion. It evidently involves the bursa placed between the tendon of this muscle and the internal condyle. This bursa is, however, in closer relation to the cavity of the joint than any of the other bursæ, and often communicates with it directly. Another form of cyst, not so frequently recognized, is that due to the outgrowth of the synovia of the joint. It involves the bursa beneath the popliteus, and appears as a deep-seated swelling in the upper portion of the calf.

A third variety of popliteal cysts is that which appears in the upper portion of the condyloid region. The bursa placed above the internal condyle is usually a prolongation of the synovia of the joint. Finally, cysts may appear in any part of the joint presenting the features of ganglion but really due to the development of subsynovial cysts or to synovial hernia.

OTOLOGY.

UNDER THE CHARGE OF

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Indications for Excision of the Malleus and Incus.

Dr. Stacke, of Erfurt, presented a paper on the above-named subject in the Otological Section of the Tenth International Congress, Berlin.

He claims that the removal of the membrana tympani and the malleus with the incus, is indicated: 1. As a means of benefiting the hearing. 2. As a means of curing some forms of chronic suppuration of the middle ear.

The first indication is manifested in certain hindrances to sound-conduction on the proximal side of the stapes, as in total calcification of the drum-membrane, ankylosis of the hammer and anvil alone, in surface-adhesion between the membrana tympani and the promontory, and in irremediable closure of the Eustachian tube. In general, the results are not brilliant, because in most cases deeper hindrances to sound-conduction exist in the fenestræ of the labyrinth, and also because regeneration of the excised membrane cannot always be prevented.

A much more important rôle has been played by excision of the membrana and the ossicles, in the last ten years, in the treatment of otherwise incurable chronic purulent suppuration in the drum-cavity.

Chronic suppuration of the middle ear, which bids defiance to mild local medical treatment, will be found generally to depend upon "bone-suppuration," either in the ossicles alone, or in them and the surrounding osseous walls of the tympanic cavity, mastoid antrum, and cells. Excision of the malleus and incus will be followed by a speedy cure of the chronic suppuration, if they alone are the seats of necrosis. Usually, however, caries of the surrounding osseous walls, especially in the so-called tympanic attic, will be found associated with necrosis of the ossicula. Stacke also claims that if the attic is diseased, especially if cholesteatomatous masses are found in this cavity, the mastoid will usually be found simultaneously affected.

He therefore does not first excise membrana and ossicles and wait to see the result before opening the attic and mastoid antrum, because he believes that generally in such a procedure the caries in the attic and mastoid are usually allowed to remain untouched. Therefore, in the treatment of suppuration of the attic space the latter should be laid freely open, so as to be thoroughly inspected after the removal of the malleus and incus. The method of doing this, as given by Stacke, has also the advantage of enabling the surgeon to determine at once whether there is at the same time any disease in the mastoid. His method is as follows: An incision is first made through the soft parts down to the bone, following the line of insertion of the auricle, from the point of the mastoid upward first, and then horizontally forward as far as the temporal region. After the hæmorrhage is quelled the periosteum must be dissected or pushed up and away from the incision toward the auditory canal, until the bony meatus is exposed. Then the periosteal lining of the canal must be loosened as far as the membrana tympani, and the periosteal cylinder thus obtained be cut through transversely; the cutaneous lining of the canal thus severed must be pushed out of the auditory canal, and, with the auricle and other soft parts, turned forward over the anterior edge of the osseous meatus and held away with retractors. In this way the entire osseous canal and the membrana tympani, surrounded by a small remnant of cutaneous lining, are laid bare to inspection. Membrana and hammer are now easily excised, and then the attic is opened by chiselling away its outer or "lateral" wall. Then the incus is to be removed, and the posterior part of the annulus tympanicus is to be chiselled away as far as the aditus ad antrum. All this can be done by direct daylight.

Injury of the stapes and tegmen tympani is prevented by the insertion of a protector (not described). When the attic is laid open sufficiently to permit a clear view of its interior, especially of the tegmen tympani, any carious spots must be carefully, but thoroughly, removed. If there are no signs of mastoid disease the operation is done, the auditory canal (soft parts) is brought back and fastened in position, and supplied with a drainage-tube. The skin-wound is stitched, and heals by first intention. The auditory canal unites. Stenosis has not occurred in nine cases thus operated on by Stacke. The after-treatment is carried on through the auditory canal, from which the attic space is now easily seen.

If during the operation simultaneous mastoid disease is discovered, the antrum is opened by means of further resection of the posterior wall of the auditory canal. Thus the drum-cavity, the attic, the aditus and the antrum are laid wide open and all the cavities of the middle ear are easily inspected. Injury of the facial nerve and semicircular canal is avoided if the operator keeps in view the probe lying in the aditus and chisels away only those parts of bone lying on the outer side of it. The wound must now be tamponed, and not stitched.

Our author also suggests that a flap be made from the cutaneous lining of the auditory canal, corresponding with that part of the posterior wall which has been chiselled away, and pushed into the antrum mastoideum, so as to introduce into this cavity healthy epidermis, and thus secure a more rapid sheathing of this large osseous space, and institute a permanent fistulous opening between antrum and auditory canal, through which the condition of the antrum can always be inspected.

Experimental Avulsion of the Stapes in Animals.

Dr. Richard Botey, of Barcelona, read a paper on this subject at the International Congress of Berlin. He was induced to make his experiments by an accident which happened while he was operating upon a patient, a man, thirty years old. It appears that while endeavoring to perform mobilization of the stapes for relief of deafness and tinnitus aurium, he pulled out the major part of the stapes, and the peri-lymph escaped from the vestibule and labyrinth. The ear was at once mopped out with an antiseptic, and the patient sent home with orders to remain there until Dr. Botey called the next day. Upon visiting the patient the next day the hearing was found to be improved, and the tinnitus had entirely ceased.

Dr. Botey then began experiments upon animals to discover (1) whether animals can hear without a stapes; (2) whether evulsion of this ossicle produces consecutive inflammation of the labyrinth; (3) whether animals hear less with an ankylosed stapes than without one; (4) whether with only the stapes they hear better than without the stapes.

Pigeons were used, as by Kessel in 1876, as the animals upon which experiments were made, since their only ossicle is a stapes, the columella.

The conclusions are as follows:

(1) Evulsion of the stapes in the animals experimented on (rabbits, pigeons, and chickens), is an entirely innocuous operation.

(2) Whether or not the membranes of the oval[1] and round windows are torn, or whether or not the labyrinth fluid escapes, a new and thicker membrane always forms after the extraction of the stapes or columella.

(3) All animals after the evulsion of their stapes hear well, but not so far, and probably by means of the membranes in the oval and round windows.

(4) Those animals from which the stapes and all other conductors of sound have been removed, but in which the membranes of the oval and round windows and the labyrinth remain normal, hear better than animals in the same condition, but which have ankylosis of the oval window.

(5) In animals which have neither membrana tympani nor columella, hearing is a little better than in those from which the membrana has been taken, but in which the stapes has been left.

(6) If partial inflammation occurs about the oval window, the foot-plate of the columella ossifies, and becomes adherent to the edges of the oval window.

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[1] In birds the columella sits upon a membrane fitted into the oval window.

(7) If it were possible to perform this operation in man as easily and as well as in birds, it would probably be as inoffensive, where the operation had been thoroughly arranged and executed with rigorous antiseptic precautions.

(8) Almost absolute proof of the preceding conclusion is offered in the case narrated at the beginning of this article.

(9) The auditory ossicles are not indispensable to hearing, as they serve only to reinforce sonorous excitations, which amounts to augmenting the distance of perception.

(10) As a final conclusion, however, it is not proposed to practise removal of the stapes in man; because, first, our experience should be greater, and also because this operation is almost impossible with our present means, as the stapes is nearly always hidden from our view, or, at best, only a portion of it is seen.

In a foot-note the author says: "Avulsion of the stapes has its analogue in extraction of cataract, which oculists have performed daily for one hundred years, because in the latter the object sought for is the removal of the obstacle to the passage of exterior vibrations to the sensorial nerve. To-day, the operation for cataract has not a mortality of even one-half of 1 per cent. The escape of the peri-lymph is still more difficult than that of the humor of the eye, because the former is contained in capillary cavities from which it cannot escape, while the liquid of the eye is less protected and the organ more inclined, perhaps, to subsequent inflammation. It appears, therefore, that when avulsion of the stapes can be rendered practicable, the operation will be for otology—the operation of the future."

OPHTHALMOLOGY.

UNDER THE CHARGE OF

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Optic Neuritis of Gonorrhœal Origin.

Dr. Panas (*La Semaine Médicale*, 1890) discusses a case that he regards as being of this description. The patient was a man, aged twenty-nine years, of good muscular development, but anæmic, who had contracted gonorrhœa four years previously, the severe symptoms continuing six months, and including a general rheumatism. The preceding year he had again contracted the disease, the acute symptoms lasting four months, and the discharge having not yet entirely ceased. After exposure to cold he had a distinct chill, and was confined to his room for ten days, with very violent pain in the head. On the eleventh day he went out; and on the next day found that he had completely lost the sight of his right eye. Some days later he appeared at the clinic. The right eye was completely blind, and showed a severe optic neuritis, passing into atrophy. The left eye had full visual acuteness, and little, if any, contraction of the field of vision, but the ophthalmoscopic examination revealed a neuritis, less advanced and milder than that of the right. Panas believes that this patient had a true gonorrhœal meningitis, which gave rise to the optic neuritis.

Brain Tumors with Eye Symptoms.

Dr. Wm. F. Norris (*Transactions of the American Ophthalmological Society*, 1890) reports two cases. In a married woman, aged thirty-two years, a glioma, starting in the right temporal lobe and posterior part of the optic thalamus, involved the right optic tract. The first symptom was inability to read long at a time, probably due to speedy exhaustion of nerve-fibres subjected to undue pressure. This had continued two months. There was also found a defect in the upper left quadrant of the field of vision for each eye. Three months later she had a seizure of dizziness, faintness, and a slight convulsion, and from that time had much pain in the right side of the head. A month later, slight haziness and prominence of the optic discs was noticed, which developed in four days to marked choked discs. After this there occurred vertical diplopia, and general mental and motor weakness; and she died six months after she was first seen.

The second case was one of carcinoma of the sella turcica and adjoining regions, also in a married woman, which probably commenced in the periosteum of the petrons portion of the right temporal bone, causing first interference with hearing, then six months later trigeminal neuralgia, and within the year diplopia and failing eyesight, probably by pressure on the nerves at their exit from the cranium. When sight had been entirely lost there was only a semi-transparent haze covering the head of the nerve, and extending into the surrounding retina, such as is seen in retro-bulbar neuritis, rather than the appearance of choked disc. A few days before death the right eye became so prominent that the lids would not close, and ulceration of the cornea occurred.

Dr. Oliver (*Ibid.*) reports a case of glioma of the external portion of the left optic thalamus, and the corpus striatum almost to its anterior third, causing flattening of the left optic tract by pressure. There was right lateral hemianopsia, with the remaining field greatly restricted in the left eye; and there were fleeting negative scotomata in the remaining field for green, also more pronounced in the left eye. The Wernicke reaction, or hemianopsic pupillary inaction sign was present. The extra-ocular muscles were unaffected. The ophthalmoscope showed the retinal arteries and veins enlarged, tortuous, and dark; and in the right eye a large splotch-like hæmorrhage extending over the lower outer quadrant of the disc. Right hemi-anæsthesia and right hemiplegia were also present.

PRISMS IN OPHTHALMIC PRACTICE.

DR. H. D. NOYES (*Ibid.*) finds that in the diagnosis of muscular asthenopia, the equilibrium test is valuable, but not decisive, and should not be the measure of error; that tests at the far point have greater value than for the near or the working points.

Weakness of abduction is a far more fruitful cause of asthenopia than is weakness of adduction, the preponderance being not far from three to one.

Abduction of less than five degrees at eighteen feet accompanied by symptoms of eye-strain justifies a trial of weak adductive prisms worn continuously. They may be permanently necessary, may be superseded by tenotomy, or may be only a temporary necessity, the symptoms disappearing. They may sometimes be worn for near work only; or, having benefited for a time, lose their good influence. In most cases tenotomy will give relief.

Refractive errors must always be corrected; but when these are of low degree, search must also be made for muscular faults; and if they are detected, prisms are also indicated in conjunction with the lenses.

Many neurotic symptoms, such as headache, mental disturbance, and remote neuralgic conditions, may be relieved by prisms.

PULSATION OF RETINAL ARTERIES FROM HOMATROPINE.

DR. G. C. HARLAN (*Ibid.*) reports a case showing the power of this drug to produce increased intra-ocular tension, and therefore glaucoma. A man, aged sixty-six years, had no other symptoms of glaucoma than impairment of central vision to $\frac{20}{L}$, and pulsation of the retinal arteries on very slight pressure on the eyeball. The installation of homatropine caused the usual dilatation of the pupil with marked pulsation. The subsequent use of eserine caused contraction of the pupil and complete cessation of the pulsation. This was tried four different times, the result being uniform, except that after sleep the pulsation produced was comparatively slight.

FILARIA OCULI HUMANI.

DR. F. M. WILSON (*Ibid.*) reports observations made by and upon a woman who had been a missionary at Benita, on the west coast of Africa, as to what is there called "the eye-worm." It seems confined to that locality, but is there common both with natives and missionaries. It is two inches long and one-sixteenth of an inch thick. Although it is often felt in other parts of the body the natives extract it only from beneath the ocular conjunctiva. Its movements cause a sensation of tickling which becomes pain as it approaches the surface, sometimes quite severe when around the eyes. It never comes to the surface of itself.

Three of these worms had been extracted from the patient in question, and specimens were presented to the Society with the report of the case.

TRANSITORY BLINDNESS WITH WHOOPING-COUGH.

DR. G. F. JACOBY (*New York Med. Journ.*, 1891) reports and discusses two cases in which this occurred. In one there was optic neuritis, with reduction of vision to the quantitative perception of light, and wide dilatation of the pupils and loss of their reaction to light or with convergence. The next day there was improvement, and in about two weeks complete recovery. The other child had been kept some days in a dark room for intense headache, and vomiting not associated with spells of coughing, and on removal was found totally blind. The pupils and the fundus of the eye were quite normal. In about two days after the blindness was recognized there was some recovery in the left half of the visual fields. In two days more the right hemianopsia had also passed away, and in a week recovery was complete.

It is pointed out that in the first case the lesion was peripheral to the centres for the reflex contraction of the pupils, while in the second it was toward the cortical centres. In both it is regarded as probably an œdema.

It is to be hoped that the publication of these cases will stimulate others to record their similar experiences, since the number of such cases now available in medical literature is extremely small.

A New Operation for Entropion and Trichiasis of the Upper Lid.

Pagenstecher (*Gräfe's Archiv*, xxxvi. 4) has in about seventy cases performed for the relief of entropion of the upper lid an operation which is essentially a modification of Hotz's operation, and which he calls advancement of the tendon of the levator.

The operator, standing at the head of the patient, first feels for the upper border of the tarsus. Immediately below this and in the middle of the lid he then makes a very small prick through the skin to mark the place where the incision is to be made. Having applied the lid forceps, an incision parallel to the lid margin is made on a level with the mark along the whole length of the lid. This incision at its middle is at once carried down to the tarsus; at the sides it only divides the skin. The muscular fibres are then carefully dissected free from the tarsus below and the tarsal ligament above. The formation of the upper flap is carried so far as to expose 3 or 4 mm. of the fascia connected with the middle or highest point of the tarsus. Three sutures are then introduced, one in the middle line and one to either side in the following manner: A threaded curved needle is passed through the skin just above the lid margin and carried upward below the separated flap of tissues and above the tarsus, then reëntered through the ligament and subjacent tendon of the levator at a point as high as can be reached by seizing firmly hold of these structures with the fixation forceps; finally, it is passed out through the skin just below the blade of the compressing forceps. On knotting these sutures care has to be taken to get good apposition of the skin wound. The advantages claimed for this proceeding are: that no part of the upper lid is removed, and that it gives rise to a firm cicatricial attachment of the fibres of the orbicularis with the border of the tarsus, the fascia, and the levator tendon, at the same time advancing the tendon, and altering its direction and point of attachment.

On the Treatment of Trachoma.

Professor Sattler, of Prague, has recently published a short monograph, entitled *Die Trachombehandlung einst und jetzt* (Fischer, Berlin, 1891). In this work, before proceeding to give an account of the treatment which he adopts, and the results obtained by it, he gives a most admirable *résumé* of the almost innumerable means which have formerly been used. Amongst the Egyptians, 1500 years before Christ, solutions of acetate of copper seem to have constituted the chief local application. The treatment adopted by Hippocrates, and which seems to have been practised for centuries, consisted in removing the granulations, and then applying the actual cautery or caustics to the raw surface.

During the period which intervened between the decay of ancient medicine and the beginning of the present century the references made in medical literature to trachoma are so meagre and indefinite, that it has been held by many authorities that the disease was first introduced into Europe on the return of the English, French, and Italian troops in 1801. Sattler gives good reasons for believing that this is a mistake, and that, notwithstanding the great epidemics which originated from this cause, and which attracted the attention, not only of military and civil surgeons, but of the different European governments, the disease had for a long time existed in Europe. Further, he points out that much of the so-called Egyptian or military ophthalmia included cases of severe catarrhal and gonorrhœal conjunctivitis, the connection of which with gonorrhœa was but imperfectly understood.

The disease, as it occurred in the epidemics thus introduced into Europe, was very generally treated by means of copious bloodletting, either by arteriotomy or phlebotomy. The patients were bled to from thirty to fifty or even sixty ounces. In addition, they were frequently subjected to large blisters between the shoulders, etc. Only a few recognized the importance of ventilation and open-air treatment. When the acute symptoms had subsided a whole host of topical agents were in use: acetate of lead, sulphate of zinc, weak solutions of copper salts and alum, weak acids, laudanum, mercurial preparations, etc. Subsequent vegetations were almost invariably treated by removal. In England, especially, the granulations seem to have been, at that time, always excised. In other countries the same effect was often produced by the use of strong caustics. Gradually, and not till after 1830, there came a reaction against the excessive and often repeated bleeding.

In 1835, Kerst, a Dutch military surgeon, introduced the so-called abortive treatment by cauterization of the conjunctiva with lapis divinus. Although this treatment, as adopted by Kerst, was not strictly followed by many of his contemporaries, it seems to have led to a more rational use of nitrate of silver, which soon became, as, indeed, it still remains, one of the chief topical agents employed. The value of sulphate of copper and acetate of lead seem only to have been recognized some ten years later.

These three substances have, for the last thirty or forty years, very properly, Sattler considers, been held in the greatest favor as local applications on trachoma in all civilized countries. He considers it certain that, by their use, many cases of trachoma have been cured—*i. e.*, have been brought to a favorable termination, and recurrences permanently checked. In his opinion, therefore, those who, like Jacobson, hold that nothing but operative treatment is of any avail, go decidedly too far. Their main disadvantage is the length of time during which the treatment has to be carried on. This, in itself, as it demands great patience both in the surgeon and the patient, must necessarily frequently be the cause of failure. The frequent disappearance of patients before a cure is effected, renders it difficult, or impossible, to root the disease out of infected localities. Sattler very properly lays stress on the uselessness of giving trachoma patients ointments and drops with which to treat themselves.

These considerations have given rise in many to the desire to shorten the treatment in some way or other. The conviction, which has more and more gained ground, that the vesicular or glandular, or so-called trachoma granulations, constitute the specific element of the disease, has led to different methods being adopted to remove or destroy these follicles.

The operative treatment of trachoma most in vogue at the present time is the excision of more or less of the affected conjunctiva, and the squeezing or raking out of the follicles.

The advantages which have been claimed for the different methods of excision of conjunctiva are the following: (1) Considerable shortening of the treatment, so that in uncomplicated cases patients are able to resume work three or four weeks afterward; (2) The subsequent disappearance of the follicles remaining in the conjunctiva of the lid; (3) A favorable and speedy effect on the corneal complications; (4) The rarity of the manifestation of recurrence; (5) The absence of subsequent changes in the position of the lids, or of cicatrices which cause any subjective disturbances, or interfere with the movements of the eyes or lids.

Sattler is able, from a large experience of the treatment by excising the conjunctival fold to confirm, in a general way, the justice of the above claims. He remarks that when, however, in order to avoid making a too complete excision, and trusting to its favorable influence on the remaining follicles, one allows groups of follicles to remain in the lower lid, conjunctiva bulbi, or caruncle, and discharges the patients before they have been caused to disappear completely by proper topical treatment, severe recurrences are by no means excluded. He considers that the chief objection which has been raised against the excision treatment, viz., that the cicatricial contractions thus caused might be worse than those resulting from the trachoma process itself, is not founded on fact, but only entertained by those who have had no experience of it. An excision of a fold two to five millimetres in breadth produces absolutely no defect, and much more extensive excisions, undertaken in the more advanced cases of trachoma, do not cause the supposed interference with the normal movements, provided they be made superficially, and do not involve the tendon of the levator, or its insertion.

Whilst, however, in Sattler's opinion, the excision method of treatment is an undoubted advance, he considers that the question may well arise whether a rapid radical cure of trachoma may not be effected by means which are more consistent with the fundamental principles of surgery. In performing excision, we remove not only the specific new formation of the trachomatous process, but, in addition, other parts which, though perhaps they may not be in a normal state, are yet only secondarily affected in a manner from which they are quite capable of recovering. He considers that the pathology of trachoma affords a well-grounded indication for the early and complete removal of the follicular deposits, while at the same time avoiding as much as possible any interference with the other tissues. The history of such attempts, and the different ways in which they have been made, is a long one, and cannot well be condensed within the limits of an abstract.

The method employed by Sattler consists in rupturing the follicles with a cataract needle, and scooping out their contents with a fine, specially constructed sharp spoon. This instrument is circular, and has a diameter of from two to four millimetres. In shelling out the contents of the follicles in the conjunctival folds, the tissues have to be put on the stretch by means of a fixation forceps. Sattler lays great stress upon eradicating all the follicles at one sitting, using a general anæsthetic when necessary. The reaction is usually inconsiderable, and the subsequent treatment consists in washing out the conjunctival sac with corrosive sublimate lotion.

DISEASES OF THE LARYNX AND CONTIGUOUS STRUCTURES.

UNDER THE CHARGE OF

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Laryngeal Paralyses.

An instance of bilateral paralysis of the recurrent laryngeal nerves in a tuberculous subject, attributed, in the absence of all indications of aortic aneurism, to compression by tuberculous mediastinal glands while the paralysis remained unilateral, and to a tumor in the posterior mediastinum when it became bilateral, and proving on the autopsy to have been due to aneurism of the aorta after all, has been reported by Dr. Eugene Fränkel, of Hamburg (*Deutsche med. Wochenschrift*, 1890). The aneurism, which was located between the left carotid and subclavian arteries, extended as far as the isthmus of the thyroid gland, which had undergone atrophy to a thin remnant by the pressure. The left recurrent nerve was firmly united to the aneurismal sac, and was transformed, about two inches above its point of recurrence, into a thin, wholly atrophied thread. So, likewise, with the right recurrent and pneumogastric nerves. A firm thrombus was discovered in the innominate vein at the junction of the jugular vein.

Similar instances of aortic aneurism without the ordinary physical signs of aneurism are not uncommon. Paralysis of the recurrent laryngeal nerves, in the absence of positive indications of different origin, is usually presumptively due to pressure from an aneurism.

LARYNGEAL PARALYSES IN TABES DORSALIS.

In opposition to Krause, according to whom posticus paralysis in the median line, unilateral or bilateral, is produced by degeneration of the superior laryngeal nerve, which excites a reflex contracture of the muscles of the vocal bands with preponderance in adduction, DREYFUSS (*Berl. klin. Woch.*, 1890, p. 899) grounds his diagnosis upon the following five conditions:

1. In the presence of other cerebral nerve paralysis it appears correct to assume a condition of irritation for the vago-accessory nucleus.
2. The frequently observed acceleration of the pulse in tabetic paralysis of the vocal bands indicates vagus paralysis.
3. Tabes with median position of the vocal band indicates paralysis of the entire accessory nerve. This was first observed by Landgraf, later by Martius, after establishment of sterno-mastoid paralysis.
4. When, as in the last case, the vocal band remains for ten years in the median position, showing a continuous reflex contracture, it is difficult to decide for or against Krause's theory, for the laryngoscopic picture is the same in accordance with this theory, or when, as the author believes, secondary adductor contracture has followed primary abductor paralysis.
5. The autopsic discovery of atrophy limited to the posticus muscles, with slightly impaired or intact musculature of the other laryngeal muscles is narrated.

The prognosis is very unfavorable in tabetic paralysis of the vocal bands; better, on the contrary, in outspoken syphilitic disease. The paralysis of the vocal bands is a frequent initial symptom of tabes and often precedes other evidences by many years.

In an examination of twenty-two tabetic patients by the essayist, in Mendel's polyclinic, motor disturbances of the vocal bands could be found only in two, contrary to the observations of Fano and Krause. In both these patients it was possible to follow the picture into the development of bilateral posticus paralysis. There were three further laryngeal conditions in tabes which were likewise posticus paralyses in advanced stage, with already established secondary contracture of the adductors. The "true ataxia" of the vocal bands, according to Krause, is held to be unnecessary, as only one muscle-group comes into consideration in disturbances of coördination. In the inspiratory abduction of the vocal bands, however, only the posterior crico-arytenoid muscle comes into function. The phonatory disturbances of coördination observed in tabes dorsalis represent no continuous symptom, a true ataxy, but belong to the category of spastic aphonia.

MORBID GROWTHS OF THE TRACHEA.

Two cases, with alarming symptoms and fatal termination, are reported by DR. PAUL KOCH, of Luxembourg (*Ann. des Mal. de l'Oreille, du Larynx*, etc., 1890).

I. A captain in the French army, forty-eight years of age, had a fine barytone voice which he over-used a great deal. Gradual dyspnœa had occurred. An immobile, sessile, red tumor was seen laryngoscopically to obstruct the trachea. Prophylactic tracheotomy was urged, but was refused on account of its effect on the voice. A few days later tracheotomy became necessary suddenly at night. The surgeon, declining Koch's counsel to perform the low operation, performed the more easy crico-tracheotomy and introduced an ordinary canula. It was of no service. Blood flowed from the canula, and the patient seemed about to expire. A longer canula was hastily introduced with no benefit. Finally, a long and flexible Koenig's canula reaching to the bifurcation was introduced, and then the bleeding ceased and respiration became established. All went well until the fourth day, when, on removal of the canula, a stream of black blood issued from the tracheal orifice and the patient immediately succumbed, although the canula had been replaced. The surgeon had incised the vascular tumor in his operation. The tumor was a cellular angio-sarcoma with large blood-vessels.

II. An advocate, thirty-eight years of age, with great dyspnœa and threatening suffocation, was seen to have a large growth in his trachea. He refused tracheotomy and died suddenly by suffocation three days later. The nature of the growth could not be determined.

TRACHEOTOMY.

On introduction of the canula, after an easy tracheotomy, in an old man, MICHAEL (*Wiener med. Wochenschr.*, No. 35, 1890) saw sudden asthma-like dyspnœa, with death in a quarter of an hour.

In a second case similar dyspnœa occurred, but was relieved by withdrawal of the canula. It recurred after every reintroduction, until Michael exsected a small piece of the anterior wall of the trachea, after which the canula was tolerated. He believed that the canula stretched the rigid cartilaginous rings of the trachea, and thereby so irritated the nerves of the mucous membrane as to produce a reflex dyspnœa.

NASAL POLYPI.

Removal of polypi from the nose by brushing them forward with a fragment of sponge attached to a string which has been passed through the nasal passages and out by the mouth, has been occasionally practised since the time of Hippocrates, but has never come into general use. DR. EDGAR KURZ, of Florence, reports (*Wiener med. Presse*, 1890) two instances of successful resort to a procedure of this kind, the suggestion in his cases having been original. With the aid of a Bellocque canula he secured three pieces of sponge of successively larger bulk to some string at suitable intervals of its length, and on drawing the string forward he withdrew the polyp in each instance with the first sponge, so that the reserve sponges did not come into play and were cut off. These patients were unable to tolerate any of the ordinary manipulations, even under cocaine anæsthesia. One operation was done under chloroform narcosis, the other under cocaine anæsthesia. In the latter instance the operation was painful, but the pain soon subsided. Dr. Kurz suggests that this method may be found useful in the removal of foreign bodies.

MICHAEL, of Hamburg (International Medical Congress, *Wiener med. Wochenschr.*, No. 35, 1890), showed a nasal polyp containing an aërial cavity.

MELANO-SARCOMA OF NOSE.

MICHAEL, of Hamburg (International Medical Congress, *Wiener klin. Wochenschr.*, No. 35, 1890), removed a tumor, together with the inferior turbinate body, and secured a permanent cure. P. Heymann cured a melano-sarcoma of the left side of the nose by removal with the platiniridium snare.

INTRA-NASAL INFECTION AFTER ELECTRIC CAUTERIZATION.

DRS. A. MAGGIORA and G. GRADENIGO, of Turin, having noted that slight hæmorrhages after electric cauterizations in the nose were followed by copious production of white fibrinous exudation, in some instances completely filling the passages, subjected the product to microscopic inspection and to investigation by culture. The pseudo-membrane was found composed chiefly of fibrin and lymph corpuscles, with colonies and groups of cocci. The cultures developed almost exclusively the *staphylococcus pyogenes aureus virulentissimus,* showing that there had been infection of the wounds from which the exudation had been taken. As the observers were positive that the infection had not been due to the use of unclean instruments, they conclude that the staphylococcus was probably present before the operation, and that its rapid increase and the consequent fibrinous exudation were due to the favoring conditions following the operations. They, therefore, consider careful and repeated disinfection of the nasal passages as necessary before undertaking any electro-caustic operations therein.—*Centralbl. f. Bacter. u. Parasit.*, 1890.

OBSTETRICS.

UNDER THE CHARGE OF

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THE CAUSATION AND TREATMENT OF PUERPERAL OSTEOMALACIA.

Nine cases of castration for this disorder are reported by FEHLING (*Archiv für Gynäkologie*, Band 39, Heft 2), in which speedy cure resulted. From the etiological study of his cases, Fehling concludes that the cause of puerperal osteomalacia is reflex disorders in the circulatory system of the patient's skeleton, which have the ovaries as the starting-point of the reflex. He observed, in common with von Jaksch, diminished alkalescence of the blood, but found a considerable excretion of calcium salts and phosphates in the urine. The curative results of operation are most striking. When pregnancy exists, Porro's operation with castration is indicated.

PREGNANCY AND LABOR AFTER CONSERVATIVE VENTRO-FIXATION OF THE UTERUS.

SÄNGER describes the results of pregnancy and parturition in two patients on whom he had performed ventro-fixation of the uterus (*Centralblatt für Gynäkologie*, No. 16, 1891). One patient aborted at three months, having suffered severe abdominal pain during pregnancy. She soon became pregnant again, and was delivered by version of a dead child a few days past her full term. She had no labor-pains of any expulsive force. The second patient was delivered spontaneously of a large, healthy child. Sänger states that in eighty-six cases treated by ventro-fixation, with preservation of the ovaries, nine pregnancies and parturitions have resulted.

In addition, LEOPOLD (*Ibid.*) reports a case in which one ovary had been removed, followed by ventro-fixation, in which a living child was born by forceps, labor-pains being deficient.

In these cases the attachment of the uterus to the abdominal wall persisted, and after recovery the uterus remained in normal position.

OSTEOMALACIA IN A MULTIPARA; CASTRATION; CURE.

HOFMEIER (*Centralblatt für Gynäkologie*, No. 12, 1891) describes the case of a multipara, aged thirty, who had osteomalacia of three years' duration. Removal of the ovaries resulted in cure. An examination of these organs showed them to be small and atrophic as those of a woman near the menopause. Few follicles were seen, and no enlargement of the bloodvessels.

EXTRA-UTERINE PREGNANCY.

At a recent meeting of the Obstetrical Society of London (*British Medical Journal*, No. 1580, 1891) TAYLOR reported a case of extra-uterine pregnancy at term, in which a living child was delivered by abdominal section, and twelve days after the placenta was removed by a second operation.

A broad ligament extra-uterine pregnancy upon the right side was reported by GRIFFITH, who diagnosticated rupture and operated, meeting with severe hæmorrhage from the sac, which could not be removed. Tamponing proved ineffectual, the patient dying an hour after the operation.

A curious case of obstructed labor, in which a large fibroma of the ovary was mistaken for the head of an extra-uterine fœtus, was also described by GRIFFITH. Craniotomy was performed, and great difficulty was experienced in delivery until version was done. The patient died of sepsis; abdominal section would have been preferable.

A case of attempted spontaneous delivery of an extra-uterine fœtus by sloughing of the abdominal wall near the umbilicus, was described by SHEILD. The patient suffered from abdominal tumor and fever, the uterus being empty.

She was a primipara. Through a circular opening at the umbilicus a black, offensive tumor projected. This proved to be a fœtus, and was extracted with its sac. The placenta was attached deeply, the sac being extra-peritoneal. The placenta was removed piecemeal, and hæmorrhage was checked by hot water and sponges.

Two cases of extra-uterine pregnancy were reported by HALLIDAY CROOM in the *Edinburgh Medical Journal*, April, 1891. One was a case of abdominal pregnancy, in which labor came on in the uterus at the termination of the normal period of gestation, resulting in a discharge of decidua. Operation was done three days later, but with fatal result. His second case was that of tubal pregnancy at the eighth week, which was removed successfully.

HART states (*Ibid.*) his conclusions regarding displacement of the placenta in extra-uterine pregnancy, and its results, as follows:

1. In the great majority of cases, extra-uterine gestation begins in some part of the Fallopian tube. It very rarely develops to an advanced period in the intact tube. A good sectional and accurate demonstration of a tubo-ovarian pregnancy is still a desideratum.
2. Ovarian pregnancy is one of the rarest occurrences possible.
3. From the tubal pregnancies we get the starting-point of most of the sequelæ of extra-uterine pregnancies, as Tait first suggested. (*a*) Rupture up to the third month through the peritoneal part of the tube. (*b*) Development in tube and broad ligament, with fœtus above and placenta below. This development may go on extra-peritoneally with child alive and placenta not displaced. Another possibility is that the fœtus may escape through the peritoneal lamina into the peritoneal cavity, the placenta remaining extra-peritoneal or in the Fallopian tube (Croom and Webster).

When the child is low and the placenta displaced, we get the suppurative termination described more particularly in the present paper.

A CASE OF TOTAL EXTIRPATION OF THE SAC OF AN EXTRA-UTERINE PREGNANCY COMPLICATED BY PERITONITIS

was reported by ODENTHAL at the Leipzig Obstetric Society (*Centralblatt für Gynäkologie*, No. 12, 1891). A diagnosis of extra-uterine pregnancy, with the fœtus contained in a muscular envelope, was made. Symptoms of peritonitis developed, and operation was undertaken. The fœtal sac, although very adherent, was removed with a portion of the mesentery. Pus and fibrinous exudate were present. The abdomen was washed out and drained with iodoform gauze. Recovery ensued, although complicated by suppuration and retention of a strip of gauze. An exudate formed with suppuration, the pus discharging through the vagina. The fœtus had lodged in the ampulla of the left tube, which had formed a muscular sac about it. The ovary was normal. The fœtus was near term.

ABDOMINAL PREGNANCY PERSISTING FOR ELEVEN MONTHS.

A case of abdominal pregnancy persisting eleven months, with death of the fœtus, is reported by PORAK (*Bulletin de la Société Obstétricale de Paris*, No. 3, 1891). He performed laparotomy, removing the fœtus, stitching the wall of the cyst to the abdominal wall, and packing the cavity with iodoform gauze sprinkled with salol. The patient made an uncomplicated recovery. The case was one of abdominal pregnancy, and was remarkable for the ease with which the fœtal sac was removed.

VAGINAL OPERATION FOR EXTRA-UTERINE PREGNANCY.

An interesting case, in which the vaginal operation for extra-uterine pregnancy was performed, is reported by CHRISTIAN FENGER in *The American Journal of Obstetrics* for April, 1891. The patient was a primipara who had suffered for several months from a tumor in the right side of the abdomen, whose presence was accompanied by hæmorrhage and discharge. On admission to the hospital fœtal outlines could be detected, the head lying in the left iliac fossa, the body inclined upward to the right; on the left side the fœtal head could be felt through the vagina. The placental souflle could be heard over the abdomen below the umbilcius to the left. The operation was performed by a median incision through the perineum to give room; the left index finger placed in the rectum marked out the extent to which the tumor was covered by the rectal wall. The transverse incision was made above this point by a cautery; craniotomy was then performed, the fœtal head presenting at the opening. It was necessary to get away portions of the fœtal bones, but the body was easily delivered. The sac was thoroughly irrigated with boric acid solution. The placenta was found high up in the left iliac fossa, and was perfectly adherent; two large drainage-tubes were put into the cavity and surrounded by gauze dusted with salicylic acid, and the vagina was also filled with this packing. Antiseptic dressing was placed over the vulva; on the seventeenth day the placenta came away. The patient made a good recovery, the uterus being of normal size firmly adherent to the left side of the pelvis; the child was at term, and was found to be in a perfectly aseptic condition. Fenger waited until a week after the placental souffle had ceased before operating. He states that when suppuration has set in, and the tumor is low down in the small pelvis, the placental circulation having ceased, the vaginal operation may be considered in comparison with the abdominal. It is also indicated in old suppurating fœtal sacs with disintegrated fœtus presenting in the vagina.

GYNECOLOGY.

UNDER THE CHARGE OF
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VAGINAL EXTIRPATION OF THE UTERUS FOR OTHER CONDITIONS THAN CANCER.

FRANK (*Centralblatt für Gynäkologie*, 1890) reports ten cases of total extirpation for myoma and seven for procidentia, with two deaths in the first series—one from shock and one from broncho-pneumonia ten days after operation. The indication in the latter series was the large size of the uterus, and the impossibility of retaining it in position; in four cases Fritsch's plan of supplementing the hysterectomy by immediate colporrhaphy was adopted with satisfactory results.

CHANGES IN THE OVARIES IN CONNECTION WITH FIBROID TUMORS.

POPOW (*Centralblatt für Gynäkologie*, 1890), from anatomical studies of forty ovaries removed in cases of castration for fibro-myoma, arrives at the following conclusions:

1. The ovaries always undergo structural changes in connection with fibromyomata; these may be interstitial or follicular.
2. Hyperplasia of the fibrous stroma, with considerable hypertrophy of the gland, is the most common change.
3. The interstitial process may be either local or general, and is associated with endarteritis and contraction of the lumina of the vessels, as well as with thickening of the perineurium and atrophy of individual nerve-fibres.
4. The follicular changes result either in complete atrophy of the follicles, leading to the formation of *corpora albicantia*, or in cystic degeneration; the former seems to be the more common of the two.

CASTRATION IN ATRESIA OF THE GENITALS.

MATTERSDORF (Inaugural Thesis, Breslau, 1890) has collected ten cases in which this operation was performed, to which he adds the report of one from the Breslau clinic. The patient was a girl, aged twenty-two years, who had never menstruated, but had severe abdominal pains every month. She apparently had no vagina, but a large tumor was found extending upward as high as the umbilicus, with which was a second smaller tumor that was evidently the uterus. The hæmatocolpos was emptied by perforation through the vulva. Four years later the patient returned with a hæmatometra, which was evacuated per vaginam, the adnexa being removed at the same time with an entirely satisfactory result.

CASTRATION IN OSTEOMALACIA.

SCHAUTA (*Wiener med. Wochenschrift*, 1890, No. 19) recommends this procedure in cases of osteomalacia in which the disease progresses after labor and does not yield to other treatment. The cure is probably due to the cessation of menstruation. He operated upon a IV.-para, aged thirty-two years, who had been suffering with osteomalacia for five years and had been confined to her bed for over a year. The pains ceased six months after the operation and the patient was able to resume her occupation.

THE LYMPHATICS OF THE FEMALE GENITAL ORGANS.

POIRIER's important studies on this subject are included in a monograph which will repay careful reading. From observations in over three hundred female subjects, women and children, in which the lymphatics were injected with quicksilver, the author has corrected several errors of former observers.

The lymphatics of the vagina form anastomosing networks in the mucosa and submucosa and empty into three sets of efferents, the upper entering the iliac glands, the lower the pelvic glands. The lymphatics on the outer side of the hymen enter the inguinal glands. The middle series follow the vaginal artery to the upper set of glands of the iliac plexus along the sides of the rectum. This accounts for the enlargement of these glands in cases of inflammation of the vagina, when they can often be felt; sometimes they suppurate and discharge the pus into the rectum. In the uterus there are mucous and submucous plexuses, also a subperitoneal plexus communicating with the former; this subperitoneal network is found in all portions of the uterus which is covered by peritoneum, and extends backward over the peritoneal covering of the tubes and laterally over the broad ligaments. Sappey denied that there was a true lymph-plexus in the peritoneum itself, but the contrary is proved by the fact that lymphatics are found in peritoneal pseudo-membranes which can be traced to the nearest chain of glands. The peritoneum covering the tubes has a distinct set of lymphatics that communicate with the plexuses in adjacent organs—an important anatomical fact in connection with the extension of inflammatory processes.

There are two sets of efferent uterine lymphatics. One set surrounds the cervix and extends laterally into the parametric tissues, along the lower borders of the broad ligaments, behind the ureters to the lateral walls of the pelvis, when they ascend to the glands at the bifurcations of the iliac arteries. The latter can be felt if enlarged, as they are distant only one and one-half or two inches from the uterus. The writer has never discovered the gland described by Lucas-Championnière, resting in the vaginal vault at the side of the cervix; but at this point there is usually a dense network of lymphatics.

The efferents from the corpus uteri consist of two or three large vessels which are situated in the upper border of the broad ligament, following the course of the ovarian artery. They lie between the tube and the ovary, receiving numerous branches from them. After arriving at the level of the fifth lumbar vertebra the opposite trunks run parallel to each other but do not communicate, and enter the lumbar glands at a point opposite to the lower borders of the kidneys. A few small lymphatic vessels from the uterus extend along the round ligaments to the inguinal glands, as figured by Mascagni. Poirier has never succeeded in injecting these distinct lymph-plexuses in the tubes, as in the uterus, but he is convinced that they exist.

The lymphatic system of the ovary is quite intricate. There are perifollicular networks, vessels from which converge to enter large efferents that emerge from the hilus to communicate with those from the uterus.

Valves are comparatively few in number throughout the pelvic system, so that retrograde infection is quite possible. The frequency of peri-uterine adhesions is due to this free intercommunication; such adhesions may result from a simple endometritis, and always have a rich supply of lymphatics. Lymphatics play an important part in pelvic inflammatory processes. The idea that inflammation extends from the endometrium to the peritoneum by direct continuity through the tubes is erroneous; if this were true, the *distal* ends of the tubes would be found to be most diseased. In all inflammatory diseases of the uterus the lymphatics are the direct carriers of infection, whether the resulting complication is simply local irritation, abscess-formation, or general peritonitis. The exudations resulting from lymphangitis separate the folds of the broad ligaments. That the cellular tissue and peritoneum are not the primary seat of the trouble is proved by the fact that the *middle portion* of the broad ligaments, which are comparatively free from lymphatics, are never the first to be affected. Fermillon's assertion, that inflammation of the broad ligaments is always secondary to disease of the tubes, and that abscesses are nearly always developed outside of the ligaments, is disproved by this fact. Salpingitis occurs by direct extension along the mucous membrane, as the lymphatics of the uterus and those of the tubes are not intimately connected, and, moreover, the lumbar glands are never affected in tubal inflammation. On the other hand, the ovarian lymphatic system communicates directly with the uterine, so that abscess of the ovary may occur in a case of puerperal endometritis, where the tube is not affected. It is possible that the lymphatics present in adhesions may also serve to transmit infection.

THE INTRA-PERITONEAL IODOFORM TAMPON.

VAN STOCKUM (*Nederl. Tijdskr. v. Verlosk. en Gynäkol.*, Band ii., Heft 1; *Centralblatt für Gynäkologie*) reviews the work of Miculicz and Fritsch, who teach that iodoform gauze may be left within the cavity for seven days, while Treub removes it at the end of from thirty-six to forty-eight hours. It has been said that the risks with the former practice are not only from iodoform poisoning and sepsis, but from the tendency to the formation of adhesions and the difficulty of withdrawing the strip. From experiments on rabbits the writer finds that neither simple exposure to the air nor manipulation of the peritoneum (as by vigorous friction with a sterilized toothbrush) was sufficient to cause adhesions. Intestinal adhesions were produced in about fifty per cent. of the cases by contact of a loop of healthy gut with a raw surface, but peristalsis might prevent this. His conclusions were that ligatures and sutures nearly always, and raw surfaces often, cause adhesions; that other manipulations during aseptic laparotomies do not cause them.

In his experiments, as soon as a gauze tampon was introduced into the peritoneal cavity the surrounding intestines became attached to it, but not sufficiently to prevent drainage of the entire cavity of the abdomen, which may continue for five days. If removed during this period no cavity is found shut off from the general cavity, but small adhesions remain, which are caused by the irritation of the tampon. If it remains a week or longer the gauze becomes encapsulated, and extensive intestinal adhesions are caused when it is removed. Miculicz's tampon has, then, two disadvantages —the formation of adhesions and paralysis of the intestines through long immobilization, and the fact that encapsulation is delayed much longer than he claimed.

The practical inference is to regard the tampon as merely a temporary hæmostatic and drain, except in cases of suppurating cysts, where it may be used for ten or twelve days.

ON THE TREATMENT AND CURABILITY OF CARCINOMA UTERI.

In a controversy between HOFMEIER on the one side and LEOPOLD and MÜNCHMEYER on the other (*Münchener med. Wochenschrift*, 1890, No. 49), the former criticises the statistics of the Munich clinic, on the ground that there is such a wide discrepancy between these and the statistics of other operators—viz., freedom from recurrence in 61.5 per cent. of the cases of total extirpation of the cancerous uterus after the lapse of two years—and, that of the twenty-six patients reported as perfectly well, fifteen had reported only in writing. In reply the other gentlemen deny the allegation, and explain their unusually favorable results by the fact that in a considerable number of the cases the disease was limited to the portio, and that it is their practice to excise the tissues beyond the actual limits of the disease.

THE EFFECT OF INFLUENZA UPON MENSTRUATION.

MIJNLIEFF (*Nederl. Tijdskr. v. Geneeskunde; Centralblatt für Gynäkologie*) noted that in women who were menstruating during an attack of influenza the flow was more profuse and prolonged. In a case of amenorrhœa the flow reappeared after an absence of four months; in another it appeared for the first time during the attack. No special treatment was indicated. The increased flow must be explained as due either to an acute endometritis, or to the presence in the blood of pathogenic microörganisms, introduced through the respiratory tract, which give rise to certain vasomotor disturbances that may lead to hæmorrhages in other organs beside the uterus. It is possible that the microbes may generate ptomaines which exert a direct irritant action upon the vasomotor system.

URETHRITIS AND ENDOMETRITIS.

VEDELER (*Norsk Mag. for Lägevid.; Centralblatt für Gynäkologie*) calls attention to the relative frequency of virulent urethritis, and its influence upon accompanying pelvic affections. In 148 patients who were carefully examined with especial reference to this point, 1.5 per cent. had urethritis, 72 per cent. specific endometritis; in 32 per cent. there was disease of the adnexa, the latter almost never being present unless there was accompanying specific vaginitis. The latter he treats with astringent injections and suppositories, endometritis with applications of acetate of lead in glycerin.

THE ULTIMATE RESULTS OF TOTAL EXTIRPATION OF THE CANCEROUS UTERUS.

TANNEN (*Archiv für Gynäkologie*, Band xxxvii., Heft 3) presents the statistics of the Breslau clinic from June, 1883, to November, 1889, including one hundred and three cases of vaginal hysterectomy; the mortality in the first sixty cases being 11.6 per cent., in the last forty-three cases 6.9 per cent. Two deaths in the first series were due to ligation of the ureter, two to sepsis, and one to iodoform poisoning; in the second series there was only one death from sepsis. 47.4 per cent. of the patients were free from recurrence at the end of three years, but several were reported as well six years after the operation. Since the disease recurred from four to six years afterward, the writer believes that the operation can hardly be regarded as promising a *radical* cure. He believes that when the disease reappears it is usually within the pelvis rather than in the cicatrix, and usually occurs within a year after the operation, the average being seven months. When there are infiltrations in the broad ligaments the best treatment is thorough cauterization, which certainly prolongs life.

THE MECHANICAL TREATMENT OF UTERINE TUMORS.

FREUDENBERG (*Frauenarzt; Centralblatt für Gynäkologie*, 1891) opposes the views of Kreissl and Carl Braun that neoplasms contra-indicate pelvic massage, and offers in evidence six cases of fibro-myoma of the uterus, which were diminished in size and the resulting symptoms relieved by the application of Thure Brandt's method, the rationale of which is the promotion of uterine contractions and the diminution of the blood-supply and pelvic congestion. This treatment is most effective when pursued during the menstrual period. No bad results have followed, and he thinks that it deserves a fair trial in the case of benignant neoplasms before adopting more radical measures.

THE ULTIMATE RESULTS OF CASTRATION.

BRODWITZ (Inaug. Dissert., Strassburg, 1890; *Centralblatt für Gynäkologie*, 1891), from a thorough study of this subject, arrives at the conclusion that in cases of general neurosis (hystero-epilepsy and epilepsy) the ovaries simply share in the central trouble, and hence castration cannot be expected to give permanent relief. Moreover, subsequent indurations and adhesions may increase the original irritation.

The ordinary sequelæ of castration are molimina, congestions, cardiac disturbances, flushing and vertigo, together with the diminution of sexual feelings in about two-thirds of the cases. Melancholy and forgetfulness are quite common, which may culminate in more pronounced psychoses. The writer's inference is that removal of the ovaries should be performed as infrequently as possible, in view of these serious after-effects.

PÆDIATRICS.

UNDER THE CHARGE OF

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URTICARIA IN CHILDREN.

COMBY (*Jahrb. f. Kinderheilk.*, xxxi. 1, 2) says that urticaria in children is accompanied by phenomena of a severe character, or may assume a chronic character and develop into prurigo. It is probably of toxic origin, occurs most frequently among badly nourished children living amid bad hygienic surroundings, and may be associated with dyspepsia and dilatation of the stomach. The hypothesis of a virus formed in the intestinal canal, taken up by the circulating blood and distributed over the skin would account for the gastic disturbances which so frequently accompany the disease. A predisposition to nervous diseases is also an influential factor, and all the disturbances occurring in adults in consequence of urticaria manifest themselves in the same way in children. The following is offered as a possible explanation: A badly-nourished child with dyspepsia has the well known wheals of the disease, which at first come and go quickly. After months or years the condition changes—there is itching, but no wheals; instead of the latter there may be papules, excoriations, fissures, or eczematous eruptions. The case is now no longer one of urticaria, but of prurigo. Kaposi also has made the observation that prurigo may develop from urticaria which has lasted one or two years. Comby does not think that teething has an especially unfavorable influence upon the disease, nor even scrofula. Disorder of the stomach in the form of weakness of digestion has been regarded as an efficient cause by several writers. Prophylaxis will consist in the adoption of a suitable diet, and since breast-fed children seldom suffer with urticaria, Comby suggests for those who are deprived of this source of nutrition a carefully regulated milk diet, suitable to the age of the patient. Meat, cereals with difficultly-digestible coverings, and alcoholic stimulants should be rigorously avoided. Over-feeding must be carefully guarded against, as this will conduce to dilatation of the stomach and dyspepsia. Sterilized milk will furnish the most appropriate nourishment. In addition the intestinal canal can be made aseptic by the suitable use of naphthol and strychnine, two centigrammes of the former being given every two hours, and two milligrammes of the latter daily. Local treatment should also be carefully provided for. Baths or local applications containing one part of vinegar and three of water, have been recommended but are not always efficient. Better treatment will consist in the daily inunction of a mixture containing one or two parts of tartaric acid and forty of vaseline. Cod-liver oil may also be used, both externally and internally.

Report on the Examination of One Hundred Brains of Feeble-minded Children.

A. W. Wilmarth, M.D., presents a careful study in the *Alienist and Neurologist*, 1890. The 100 cases given may be summarized as follows: Sclerosis with atrophy, 12; sclerose tubereuse, 6; diffuse sclerotic change, 7; degenerative changes in vessels, ganglionic cells, or medullary substance, not constituting true sclerosis, 15; hydrocephalic, 5; general cerebral atrophy, 2; non-development in various forms, 16; infantile hæmorrhage, 1; extensive adhesion of membranes from old meningitis, 3; angiomatous condition of cerebral vessels (with degenerative changes), 1; glioma (with sclerosis), 1; porencephalous (with non-development), 1; of thirty-one cases where actual disease or imperfect development of the brain proper was not demonstrated, there was hypertrophy of the skull, 6; acute softening (recent), 2; demi-microcephalic, 2; when the brain was above usual weight, but the convolutions large and very simple in their arrangement, 2.

The average weight of the brain was 38.3 ounces, but in fourteen cases the weight was below 30 ounces.

Attention is called to the comparatively large number of cases of actual cerebral disease, in contrast with the relatively small number where imperfect development seems the causative agent of the mental defect. With this fact, we see a corresponding improbability of a large majority of these cases ever attaining a full mental development. Children inheriting inactive brain from parents below the usual average of intelligence, without history of infantile disease or epilepsy, seem the most promising of general and permanent improvement.

The brain diseases of infancy are peculiarly destructive, and not only leave a permanent injury to the brain, preventing its growth and development, but are liable, from the irritation they leave, to kindle the epileptic habit with its destructive effects.

Elementary Considerations Concerning the Treatment of Suppuration in Cavities with Firm Walls.

In the discussion of KÜSTER'S (*Jahrb. f. Kinderheilk.*, xxxi. 1, 2) paper before the Berlin Medical Society the following points were elicited:

Senator considered the question of incision of the thorax in empyema occurring in small children. Such a procedure might occasionally be indicated, but not so urgently as in adults. The result of this disease in children was frequently favorable without incision, the pus finding exit through the bronchi. Puncture alone without irrigation frequently led to a cure. Incision at a late period, if necessary, would give no worse result than an early operation. Puncturing might be tried twice, or oftener, before resorting to incision.

Henoch could recall only two or three cases in which empyema in children following scarlet fever was cured by puncture. In all other cases incision was indicated. Bouchut had punctured the thorax twelve times in one case, and such a course could not be recommended. Hectic fever was an urgent indication for incision, and this procedure should be practised after one or two ineffectual punctures, even if fever were absent. Urgent dyspnœa was a warning that incision must not be deferred. Henoch had usually resected one or two ribs in addition to incision, and with satisfactory results. With phthisical children the operation should not be performed. Cases of this character in which he had operated had resulted badly.

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